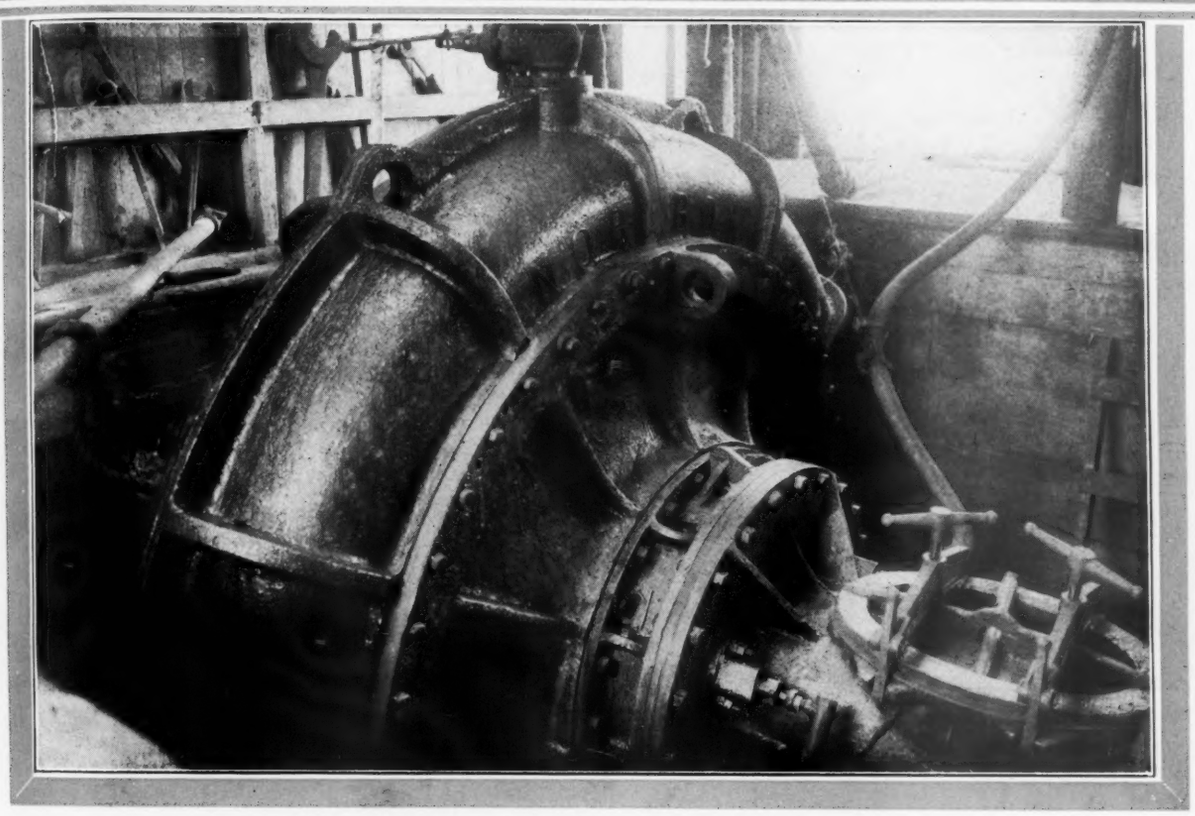
Pit and Quarry
With which is consolidated
CEMENT-MILL & QUARRY
August 24, 1932 AUG 27 1932



20" Sand & Gravel Dredge Pump. 78" Impeller.

NORBOM engineers have developed dredge pumps to a very high point of efficiency, aiming to reduce to a minimum expensive shut downs for repairs and to give the greatest possible output per horsepower hour for any given pumping condition.

Screwed on impeller, double stuffing box, protection of the shaft by a hard steel sleeve where it passes through stuffing box, curved side runner and front cover, a positive self adjusting sealing ring coupled with clear water service at this point, elimination of balance holes in back shroud, careful design of volute or casing with metal thickened where observation of worn out pumps has proved it to be advisable, are a few of the points which make Norbom pumps far superior to others.

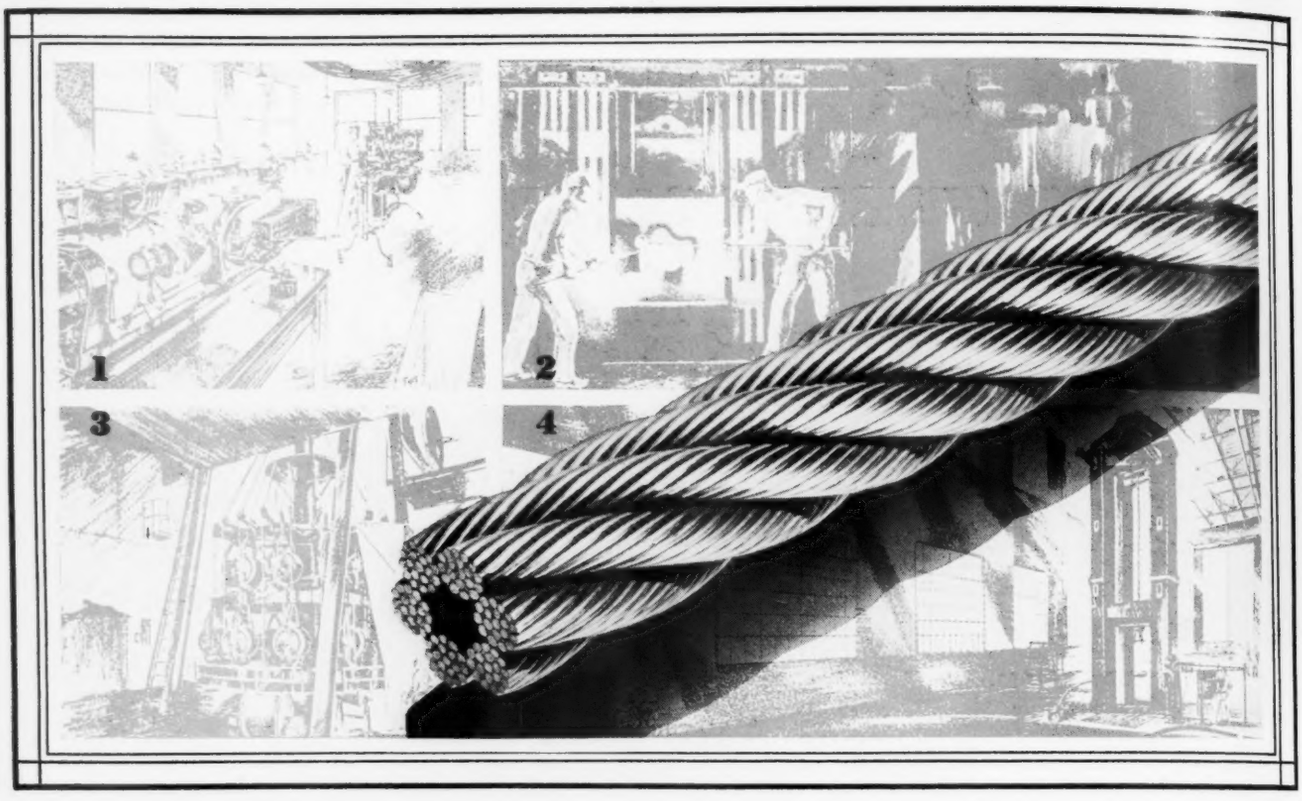
All parts subjected to excessive wear are made of Norballoy, a metal which both by laboratory tests and actual service tests has proved its superiority over any other alloy steel now on the market. **We do not make our pumps so hard that they crack up in service.** Each part is heat treated to the proper degree of hardness for the service which it must give.

In replacing pumps of other manufacture, we have never failed to show a material increase in production and in some cases we have shown **twice the life on shells and four times the life on impellers.**

Let us quote on complete Norbom Dredges, Dredge Pumps, Cutter Machinery, Winding Machinery, Sheave Blocks, Pontoon Line Ball and Socket Joints, etc., or on rebuilding your present pumps for LONGER LIFE and HIGHER EFFICIENCY.

Norbom Engineering Co. **Darby, Penna.**

Since September 11, 1929, the largest net paid A. B. C. circulation in the field



THESE are the *Facts* behind all Roebling Rope claims

We have made very definite claims regarding Roebling Rope.

We have asserted: (a) that the safety of Roebling Rope is *unsurpassed;* (b) that NO wire rope, regardless of make or construction, will show *lower* general-average operating cost; (c) that Roebling Ropes, incorporating this safety and economy, can be obtained in types and constructions *most suitable* for every wire rope need.

In the first place, these claims are founded on the actual performance of Roebling Rope. Secondly, they are made possible by:—

1. Constant research carried on by the Roebling Laboratory, one of the country's finest, most completely equipped research units.

2. Roebling Acid Steel, custom-made in *small* open-hearth furnaces. Acknowledged by the steel industry to be the finest rope steel made.

3. Superior rope-making equipment, in one of country's largest, most modern wire rope plants.

4. Unequalled testing facilities.

When in the market for wire rope, it will pay you to keep these FACTS in mind. They are assurance of utmost wire rope safety and minimum wire rope service cost.

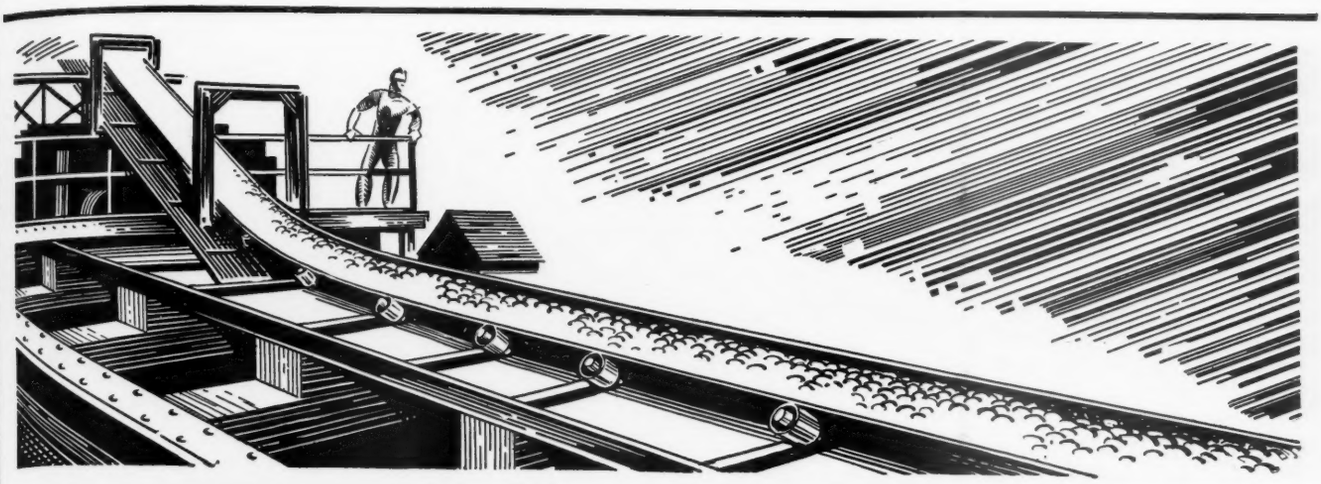
JOHN A. ROEBLING'S SONS CO., TRENTON, N.J.

Wire · Wire Rope · Copper and Insulated Wires and Cables
Welding Wire · Flat Wire · Wire Cloth and Wire Netting

Branches in Principal Cities Export Dept.—New York, N.Y.

JOHN A. ROEBLING'S SONS COMPANY

PROVEN ECONOMY



Rugged, Dependable

For eighty-six years New York Belting & Packing Company has built conveyor belts of unusual stamina and resistance against gruelling service. During this time these belts have found every possible opportunity of proving their true worth—of establishing amazing records for economy in operation.

The really *good* Conveyor — the kind *you* want — is the one that will take plenty of tough punishment — take it week after week — and then pay for itself on the cost sheet.

In every part of this country, N. Y. B. & P. conveyor belts have been establishing standards for long wear and trouble-free service. And — replacements tell the tale. Experienced buyers avoid the dangers of speculation by specifying N. Y. B. & P. quality.

N. Y. B. & P. Co. Products are sold exclusively through competent distributors

NEW YORK BELTING & PACKING CO.

211 PASSAIC ST. PASSAIC, N.J.

Pit and Quarry

With which is consolidated
CEMENT-MILL & QUARRY

Volume 24 August 24, 1932 Number 11

MEMBER AUDIT BUREAU OF CIRCULATIONS

Published bi-weekly on Wednesday for producers and manufacturers of Cement, Crushed Stone, Gypsum, Lime, Sand, Gravel and other nonmetallic minerals. Entered as second-class matter October 9, 1928, at the Postoffice at Chicago, Ill., under the Act of March 3, 1879.

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HOW MANY TONS

AND AT

WHAT COST

PER TON?

GOODYEAR Conveyor Belts answer the question with more tons carried, at lower cost per ton.

They are able to answer it to the plant owner's saving and profit simply because they are scientifically constructed, of the proper materials, on accurate specification to the job by the G. T. M.—Goodyear Technical Man.

The G. T. M. is an expert on rubber. He has a thorough practical experience in the conveyor duty imposed by pit and quarry, sand and gravel, and rock products service. By means of an on-the-job analysis of your particular plant requirements he is able to recommend the conveyor belt construction — weight and ply and cover stock — that will serve you most efficiently and economically.

Why not have the G. T. M. make a study of your conveyor requirements in cooperation with your plant officials? On hundreds of jobs, all over the country, his analyses have resulted in longer belt life, more tons carried, and lower conveying costs. To get in touch with him, drop a line to Goodyear, Akron, Ohio, or Los Angeles, California.

TUNE IN:

Goodyear invites you to hear the Revelers Quartet, Goodyear Concert-Dance Orchestra and a feature guest artist every Wednesday night, over N. B. C. Red Network, W E A F and Associated Stations

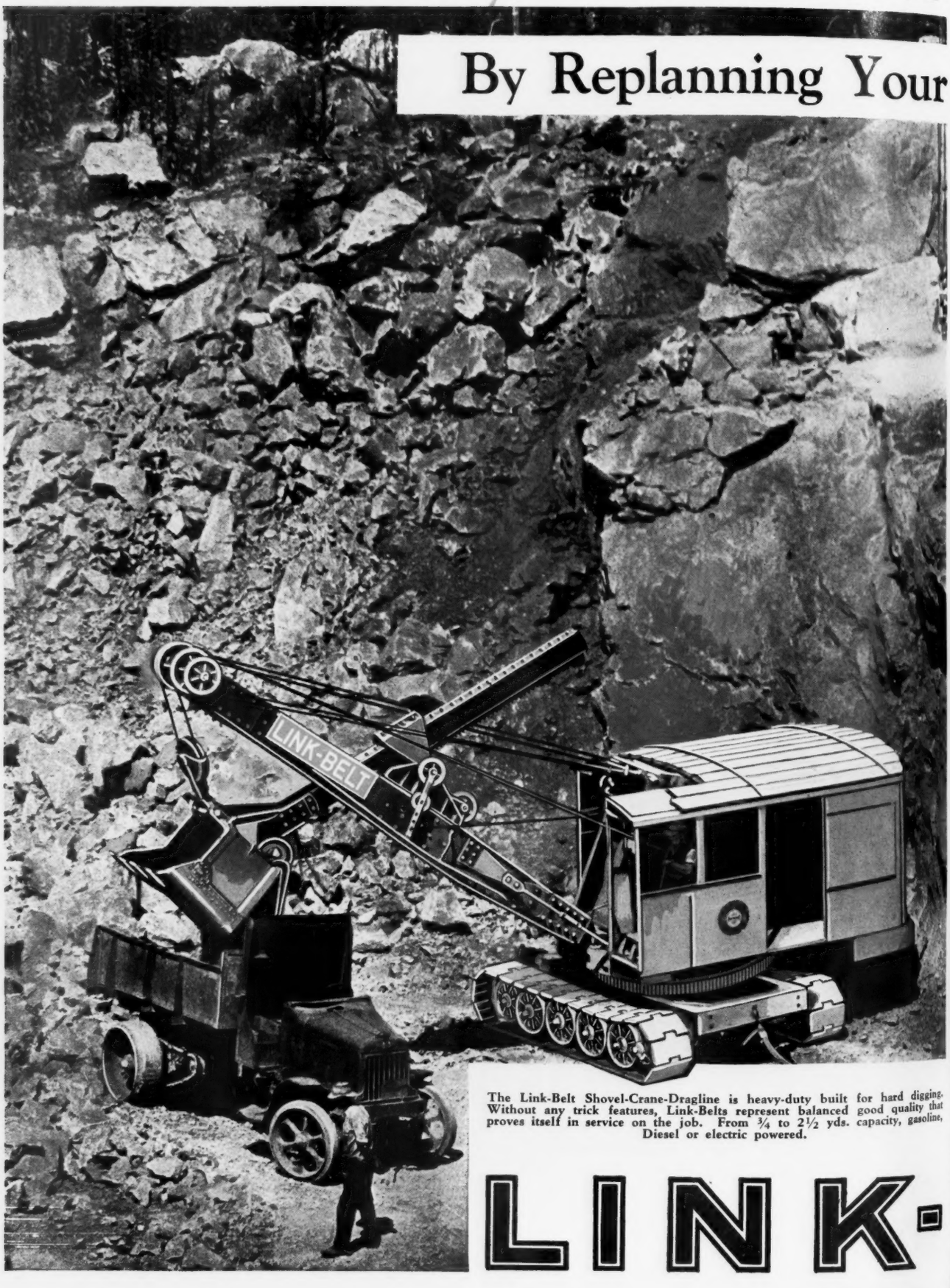
THE GREATEST NAME IN RUBBER

GOODYEAR

BELTS • MOLDED GOODS • HOSE • PACKING

Meet Today's Markets

By Replanning Your



The Link-Belt Shovel-Crane-Dragline is heavy-duty built for hard digging. Without any trick features, Link-Belts represent balanced good quality that proves itself in service on the job. From ¾ to 2½ yds. capacity, gasoline, Diesel or electric powered.

LINK-

A complete Link-Belt sand and gravel washing plant.

Handling and Preparation

IN the face of today's competition only those producers whose plants are thoroughly modernized will operate at a profit. Bring your plant up to the best competitive level that modern facilities will permit.

This does not necessarily mean that you will have to redesign completely. Possibly a rearrangement or adjustment in layout, or an additional unit or replacement here and there, will be all that is required.

The Link-Belt Vibrating Screen. A triumph of mechanical vibration.

Put up to Link-Belt the responsibility for the balanced arrangement and correct application of the right equipment and methods to meet your requirements. For washing, screening, sizing, conveying, elevating, mixing, or excavating, there is a variety of equipment in the Link-Belt line to meet every requirement. Unbiased selection of the right unit and correct layout to give exactly the desired results, is assured.

Can your present methods be improved?

Link-Belt manufactures every approved type of conveying equipment, such as belt, apron, bucket, screw, flight, and other types.

Link-Belt screens include: inclined conical, vibrating, rotary disc grizzlies, bar, rotary—all types, for every service.

LINK-BELT COMPANY

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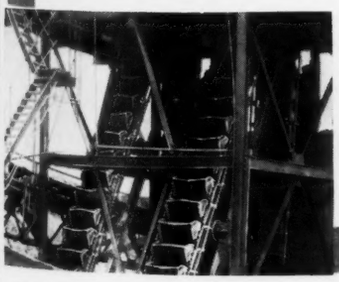
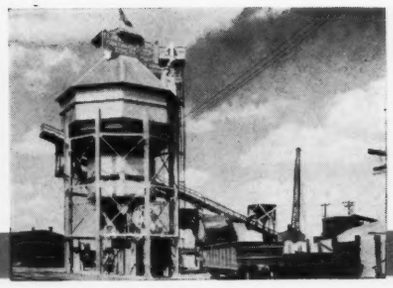
CHICAGO, Caldwell-Moore Plant, 2410 W. 18th St.
INDIANAPOLIS, Ewart Works, 200 S. Belmont Ave.
PHILADELPHIA Works, 2045 W. Hunting Park Ave.
SAN FRANCISCO Works, 400 Paul Ave.
In Canada—Link-Belt Limited—Toronto Works; Montreal; Vancouver
Offices in all Principal Cities

4594



Elevators of all types and capacities, portable loaders, skip hoists, etc.



Complete equipment for central concrete mixing—elevators, conveyors, unloading shovels, feeders, etc.

Link-Belt steel apron feeder for aggregates in central concrete mixing plant.

BELT

Elevating—Conveying—
Screening—Washing—
Excavating Equipment

Classified Buyer's Guide

A Directory of PIT AND QUARRY Advertisers Arranged According to Product

Although every effort is made to insure accuracy and completeness in these listings, the publisher cannot accept responsibility for errors or omissions. Any mistakes discovered will gladly be rectified, if brought to the attention of the Advertisers' Service Department.

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Allen-Sherman-Hoff Co.
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Asphalt, Cold Mix, Plants
Simplicity System Co.

Automatic Feeders
Link-Belt Co.

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Ryerson and Son, Inc., Joseph T.

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Kennedy-Van Saun Mfg. & Engr. Corp.

Balls (Tube-Mill, etc.)
Kennedy-Van Saun Mfg. & Engr. Corp.

Barges (Steel)
Norbom Engr. Co.

Bearings (Anti-Friction)
Link-Belt Co.

Belt Drives
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Link-Belt Co.
Manheim Mfg. & Belting Co.
New York Belting & Packing Co.

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Bins (Steel)
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McLanahan and Stone Corp.

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Crushers (Jaw and Gyratory)
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McLanahan and Stone Corp.
Traylor Eng. & Mfg. Co.

Diesel Engines (See Engines—Diesel)

AMERICAN STEEL & WIRE COMPANY
WIRE ROPE
The TIGER TRADE MARK is a symbol of Strength and Dependability
THE MARK FOR GENUINE AMERICAN WIRE ROPE

AMERICAN STEEL & WIRE COMPANY WIRE ROPE

A Watch is Only as Good as its Inner Works

And Wire Rope is only as good as the wires of each strand.

In wire rope manufacture—as in watch making—no end of care must be taken to insure that each part will perform its particular job unfailingly.

Here—then—is a Wire Rope that you may specify for every task that wire rope has to do. Surely—the fact that American Steel & Wire Company Rope outsells all others is proof of performance on the job that saves money and avoids disappointment.

1831 — MORE THAN 100 YEARS of PROGRESS IN WIRE MAKING — 1932

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First National Bank Bldg., Baltimore

Pacific Coast Distributors: Columbia Steel Company, Russ Building, San Francisco
Export Distributors: United States Steel Products Company, New York

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Drills, Diamond
Pennsylvania Drilling Co.
Sprague and Henwood, Inc.

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Traylor Eng. & Mfg. Co.

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Allen-Sherman-Hoff Co.

Dust Handling Systems (Hydro Vacuum)
Allen-Sherman-Hoff Co.

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Nordberg Mfg. Co.

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Nordberg Mfg. Co.

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Nordberg Mfg. Co.

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Kennedy-Van Saun Mfg. & Engr. Corp.
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New York Belting & Packing Co.

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Lime Kilns
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Loaders and Unloaders
Haiss Mfg. Co., Geo.
Link-Belt Co.

Locomotives (Electric, Gas and Steam)
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Magnetic Clutches (See Clutches, Magnetic)

Mill Liners & Linings
Kennedy-Van Saun Mfg. & Engr. Corp.
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Mills (Grinding) (See also Crushers—Hammer)
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Kennedy-Van Saun Mfg. & Engr. Corp.
Lewistown Fdy. & Mach. Co.
Traylor Eng. & Mfg. Co.

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Nails
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Ore Separators
Allen Cone and Machy. Corp.

Oxygen (Liquid) (See Liquid Oxygen)

Packing
Goodyear Tire and Rubber Co., Inc.
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National Wire Cloth Co.

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GASOLINE » DIESEL » ELECTRIC POWER
INSIDE OR OUTSIDE DIPPER HANDLE
CHAIN OR CABLE CROWD » » » » » »

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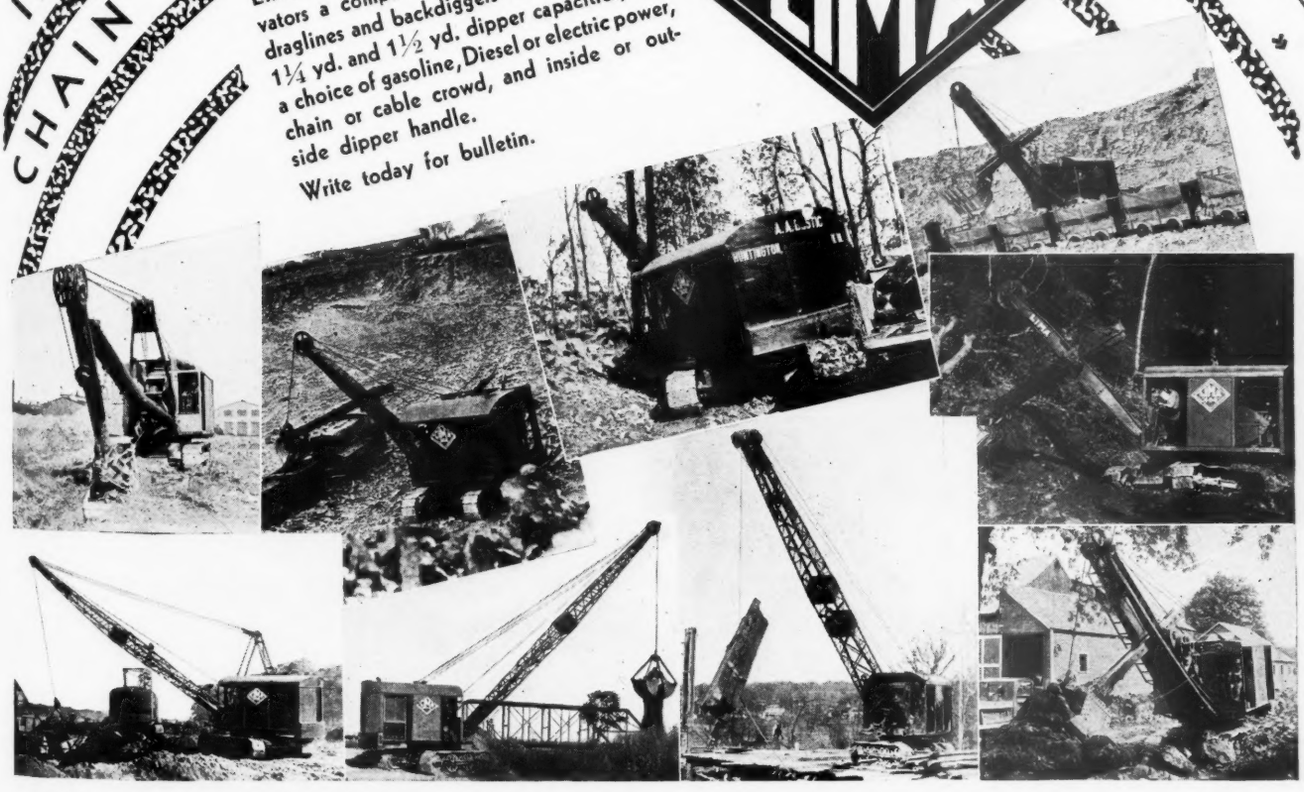
Write today for bulletin.



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SPOKANE East 3500 Block Riverside Avenue
PORTLAND 94 First Street

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Tyee Machinery Company, Ltd. Vancouver, B. C.

LIMA 101-302-404 502 and 601

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Power Shovels (See Shovels, Electric, Internal-Combustion, and Steam)

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Universal Road Machinery Co.

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Lewistown Foundry & Machinery Co.

Pumps (Cement Slurry)
Allen-Sherman-Hoff Co.

Pumps (Centrifugal)
Allen Cone and Machy. Corp.
Allen-Sherman-Hoff Co.
Chain Belt Co.
Erie Pump & Engine Works
Norbom Engr. Co.

Pumps (Dredging)
Allen-Sherman-Hoff Co.
Erie Pump & Engine Works
Norbom Engr. Co.

Pumps (Sand and Gravel)
Allen Cone and Machy. Corp.
Allen-Sherman-Hoff Co.
Erie Pump & Engine Works
Kansas City Hay Press Co.
Norbom Engr. Co.

Ready-Mixed Concrete Plants
Chain Belt Co.

Respirators
Pulmosan Safety Equipment Corp.

Rock Drills (See Drills—Rock)

Rod Mills
Kennedy-Van Saun Mfg. & Engr. Corp.
Traylor Eng. & Mfg. Co.

Roofing and Siding (Steel)
Ryerson and Son Inc., Joseph T.

Rope (Wire) (See Wire Rope)

Rubbish Burners
Cross Engineering Co.

Safety Equipment
Pulmosan Safety Equipment Corp.

Sand Separators
Allen Cone and Machy. Corp.
Link-Belt Co.
McLanahan and Stone Corp.
Smith Engineering Works

Sand-Settling Tanks
Allen Cone and Machy. Corp.
Link-Belt Co.
Smith Engineering Works

Scrapers (Power Drag)
Link-Belt Co.
Sauerman Bros., Inc.

Screens
Allen Cone and Machy. Corp.
Chain Belt Co.
Chicago Perforating Co.
Cleveland Wire Cloth & Mfg. Co.
Cross Engineering Co.
Deister Concentrator Co.
Deister Machine Co.
Gay, Rubert M.
Gifford-Wood Co.
Haiss Mfg. Co., Inc., George
Kennedy-Van Saun Mfg. & Engr. Corp.
Lewistown Foundry & Machinery Co.
Link-Belt Co.
McLanahan and Stone Corp.
National Wire Cloth Co.
Roebling's Sons Co., John A.
Smith Engineering Works
Traylor Eng. & Mfg. Co.
Universal Road Machinery Co.

Screens (Vibrating or Shaking)
Allen Cone and Machy. Corp.
Deister Concentrator Co.
Deister Machine Co.
Gay, Rubert M.
Gifford-Wood Co.
Kennedy-Van Saun Mfg. & Engr. Corp.
Lewistown Foundry & Machinery Co.
Link-Belt Co.
McLanahan and Stone Corp.
Universal Road Machinery Co.

Separators (Air) (See Air Separators)

Sheaves
Chain Belt Co.
Haiss Mfg. Co., Geo.
Link-Belt Co.
McLanahan and Stone Corp.

Shovels (Electric, Internal-Combustion and Steam)
Link-Belt Co.
Ohio Power Shovel Co.

Silos
Chain Belt Co.

Skip Hoists and Skips
Chain Belt Co.
Gifford-Wood Co.
Link-Belt Co.

Speed Reduction Units
Chain Belt Co.
Link-Belt Co.

Spouts (See Chutes and Chute Liners)

Sprockets and Chain
Chain Belt Co.
Link-Belt Co.

Steel (Alloy)
Chain Belt Co.

Steel (Bars, Shapes, Plates, etc.)
Ryerson and Son, Inc., Joseph T.

Steel Grating (See Grating, Steel)

Steel Inclines (See Inclines, Steel)

Storage Equipment
Chain Belt Co.
Haiss Mfg. Co., Geo.
Link-Belt Co.
Sauerman Bros., Inc.

Sweeping Systems
Allen-Sherman-Hoff Co.

Tanks (Sand-Settling)
Allen Cone and Machy. Corp.
Link-Belt Co.
Smith Engineering Works

Tools (Drill) (See Drilling Accessories)

Track Shifters
Nordberg Mfg. Co.

Tramways (Aerial)
American Steel & Wire Co.
Roebling's Sons Co., John A.

Transmission Belting (See Belting)

Transmission Machinery
Chain Belt Co.
Link-Belt Co.

Trippers
Chain Belt Co.
Link-Belt Co.

Truck Cranes (See Cranes)

Truck Mixers
Chain Belt Co.

Tube Mills (See Mills—Ball, Tube, etc.)

Tube-Mill Liners (See Mill Liners and Linings)

Unloaders (Box Car)
Chain Belt Co.
Link-Belt Co.

Valves (Pump)
Manheim Mfg. & Belting Co.

Variable Speed Reducers or Transmissions
Chain Belt Co.
Link-Belt Co.

Vibrating Screen Plate
Chicago Perforating Co.
Cross Engineering Co.

Vibrating Screens (See Screens—Vibrating)

Washers (Sand, Gravel, and Stone)
Allen Cone and Machy. Corp.
Haiss Mfg. Co., George
Kennedy-Van Saun Mfg. & Engr. Corp.
Lewistown Foundry & Machinery Co.
Link-Belt Co.
McLanahan and Stone Corp.
Smith Engineering Works
Traylor Eng. & Mfg. Co.

Welding Supplies
Roebling's Sons Co., John A.

Well Drills (See Drills—Well)

Winches and Capstans
Chain Belt Co.
Link-Belt Co.

Wire Cloth
Cleveland Wire Cloth & Mfg. Co.
National Wire Cloth Co.
Roebling's Sons Co., John A.

Wire Rope
American Steel & Wire Co.
Leschen and Sons Rope Co., A.
Roebling's Sons Co., John A.

Wire-Rope Fittings
American Steel & Wire Co.
Leschen and Sons Rope Co., A.
Roebling's Sons Co., John A.

Wire-Rope Slings
American Steel & Wire Co.
Leschen and Sons Rope Co., A.
Roebling's Sons Co., John A.

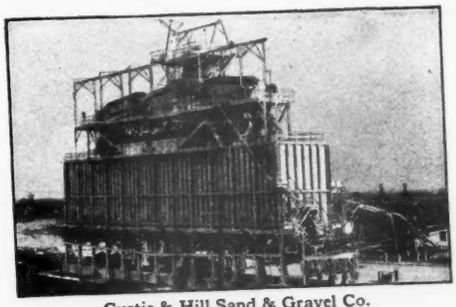
Wire (Welding)
American Steel & Wire Co.
Roebling's Sons Co., John A.

Wire and Cable (Electric)
American Steel & Wire Co.
Roebling's Sons Co., John A.

Worm Gears (See Gears and Pinions)

No HAND-ME-DOWN PLANTS HERE . . .

No two Telsmith gravel or quarry plants are alike. Since every deposit presents separate and distinct engineering problems which affect both equipment and design—Telsmith plants are "tailor made."



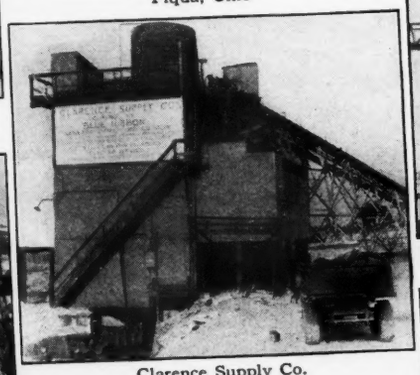
Curtis & Hill Sand & Gravel Co.
Morrisville, Pa.

Hoffman Bros. & Wilson
Harrisburgh, Pa.

Helena Sand & Gravel Co.
Helena, Montana

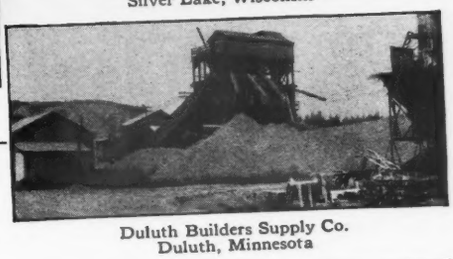
Bowsman Washed Sand & Gravel Co.
Piqua, Ohio

Kenosha Sand & Gravel Co.
Silver Lake, Wisconsin



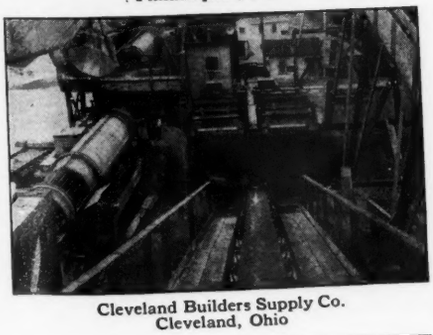
Clarence Supply Co.
Clarence, New York

Missouri Portland Cement Co
Memphis, Tennessee



Duluth Builders Supply Co.
Duluth, Minnesota

Bristol Sand & Gravel Co.
Philadelphia, Pa.



Cleveland Builders Supply Co.
Cleveland, Ohio

TELSMITH . . .
a balanced service

Telsmith Balanced Service starts at your plant site . . . and Telsmith engineers overlook nothing. They study the deposit from every angle . . . consider every element that affects excavating, crushing, screening, washing, and loading operations . . . select the most economical method and the right mechanical units . . . Telsmith-designed and Telsmith built . . . for each operation. Telsmith takes complete responsibility and *guarantees results.* Get the facts . . . write for Bulletin G-15. *Smith Engineering Works, 504 E. Capitol Drive, Milwaukee, Wis.*

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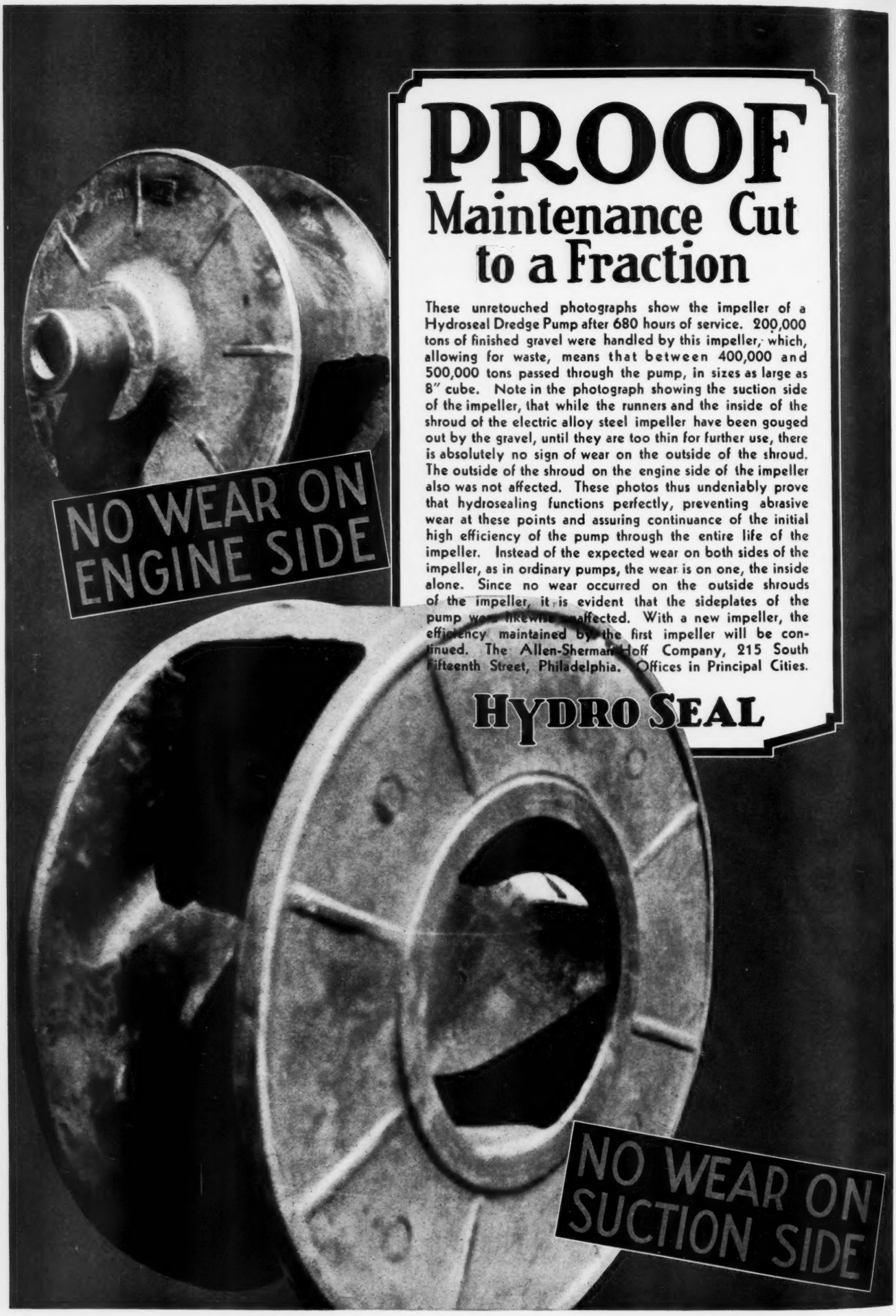
TELSMITH G-18


PROOF
Maintenance Cut to a Fraction
These unretouched photographs show the impeller of a Hydroseal Dredge Pump after 680 hours of service. 200,000 tons of finished gravel were handled by this impeller, which, allowing for waste, means that between 400,000 and 500,000 tons passed through the pump, in sizes as large as 8" cube. Note in the photograph showing the suction side of the impeller, that while the runners and the inside of the shroud of the electric alloy steel impeller have been gouged out by the gravel, until they are too thin for further use, there is absolutely no sign of wear on the outside of the shroud. The outside of the shroud on the engine side of the impeller also was not affected. These photos thus undeniably prove that hydrosealing functions perfectly, preventing abrasive wear at these points and assuring continuance of the initial high efficiency of the pump through the entire life of the impeller. Instead of the expected wear on both sides of the impeller, as in ordinary pumps, the wear is on one, the inside alone. Since no wear occurred on the outside shrouds of the impeller, it is evident that the sideplates of the pump were likewise unaffected. With a new impeller, the efficiency maintained by the first impeller will be continued. The Allen-Sherman-Hoff Company, 215 South Fifteenth Street, Philadelphia. Offices in Principal Cities.
HYDRO SEAL
NO WEAR ON ENGINE SIDE
NO WEAR ON SUCTION SIDE

VOLUME 24 NUMBER 11

Pit and Quarry

With which is consolidated

CEMENT-MILL & QUARRY

CHICAGO, AUGUST 24, 1932

Cement Mills Reöpen After Summer Slump

SCORES OF WORKERS RECALLED

August 1 marked the reöpening of several Portland-cement plants which had been closed for a number of months.

The Spokane Portland Cement Co. reopened its plant and quarry Aug. 1, H. M. Heleniak, salesmanager, announced. The plant is at Irvin, Wash., and the quarry north of Colville. Sixty men were recalled to work, plans being to continue operation until late winter.

"It is my confident belief that conditions are improving, and I look for a steady improvement in lines of trade," Mr. Heleniak said. "This company is sure of returning normal conditions and the desire to hasten their approach impels us to open up operations, although we could continue to care for shipments for some time without resuming operations, filling orders from our stocks."

Fifty-six employees of the Yosemite Portland Cement Corp. resumed work at the Merced, Cal., plant Aug. 1, as all departments of the plant were reopened after a several months' period of partial inactivity. The plant virtually had been shut down since April 1.

The Southwestern Portland Cement Co. plant of Victorville, Cal., began operations Aug. 1., after a six weeks' shut down. Practically all of the storage bins of the plant have been emptied, and prospective orders and contracts on hand seem to assure operation of the plant steadily for a long time. The company recently placed in a low bid, jointly with three other southern California plants, on the cement to be furnished in the construction of the new Pine Canyon Dam for the City of Pasadena.

The North American Cement Corp. plant at Alsen, N. Y., resumed operations on Monday, Aug. 1, with about 140 hands employed. It was not said how long the plant would continue operations, but it is hoped there will not be another shutdown for some time.

The Alpha Portland Cement Co. mill at Cementon, N. Y., also resumed operations. Some repairs have been made at the plant during the spring and summer.

The Beaver Portland Cement Co. resumed operations in the raw-grinding department at its plant at Gold Hill, Ore., July 29. The quarry crew had been working for several days previous, preparing for plant operation.

The plant of the Ash Grove Cement Co., in Louisville, Neb., has resumed operation, after having been closed since last March. It is now operating on full time, according to A. K. Frolich, superintendent.

Marquette Rebuilds Its Peru Loading Terminal

Reconstruction of the Marquette Cement Manufacturing Co.'s river terminal at Peru, Ill. including the installation of improved loading equipment is in progress, and the rebuilt terminal is expected to be ready to load river barges by the middle of August.

Cement, brought from the company's plant at Oglesby, is elevated from cars and conveyed overhead to the barges tied up in the river. The new equipment has a loading capacity of 400 bbl. per hr. and the company's four barges have a total carrying capacity of 16,000 tons. The cost of the improvements will total about $10,000.

New Ohio Gravel Plant Will Operate This Month

Construction work on the sand-and-gravel plant being erected by C. C. Beam, Inc., near Sligo, O., is being rushed to completion by the Champion Bridge Co. The plant is expected to be ready for operation within the next week. Machinery has been installed and rapid progress is being made on the project.

Birmingham Slag Plants Will Start Work Shortly

It is expected that several plants of the Birmingham Slag Co., Birmingham, Ala., will reopen within the next few weeks according to a recent announcement. The new activity is expected in connection with extensive road building projects in Alabama and nearby states.

Detroit Conventions Set for Jan. 16 to 20

ONE EXHIBIT FOR 3 GROUPS

Since announcement was made in the last issue of PIT AND QUARRY regarding the Highway and Building Congress to be held at Detroit, Mich., during the week of January 16, 1932, initial plans for the concurrent meetings of the participating organizations, of which there are ten, as well as of the exhibits, have been made.

The National Sand & Gravel Assn., the National Crushed Stone Assn., and the National Ready-Mixed Concrete Assn., will hold independent meetings at the Book-Cadillac Hotel, but the exhibit of machinery will be consolidated in a single show, also to be held at the Book-Cadillac, on the same floor as the main convention hall. Unanimous decision to hold a separate show for the material producers was made at a meeting of the executive committees of the Manufacturers' divisions of the sand-and-gravel and crushed-stone associations, held at Detroit on July 27. It had been proposed that these exhibits be combined with the heavy-machinery show of the American Road Builders' Assn., which will be held at the Detroit Airport, but the manufacturers' representatives were of the opinion that the identity of the material-producers' exhibit should be retained, so the matter was voted down. This will be the first time, however, that the shows of the sand-and-gravel and crushed-stone conventions have been combined.

The dates for the convention of the National Sand & Gravel Assn. convention have been definitely fixed for January 17 and 18, while the National Crushed Stone Assn., will probably meet the full three days allotted to concurrent meetings—January 16, 17 and 18. The National Ready Mixed Concrete Assn. will meet on one of the days, probably Monday, January 16.

On Thursday and Friday, January 19 and 20, all organizations participating in the Congress will join in a two-day program. The Thursday meeting will be devoted to highways, their strategic position in the progress of the nation will be reviewed and plans to continue the big road-build-

(Continued on page 14)

Survey Shows Gains for Low-Cost Roads

ASPHALT INSTITUTE FIGURES

A survey of street and highway paving and surfacing done during 1931 has just been completed by The Asphalt Institute. Analysis of reports from 48 state highway departments, 410 leading counties, 167 of the principal cities and 47 of the larger New England towns, shows that, during 1931, an aggregate of 463,736,045 sq.yd. of street and highway were improved beyond the stage of plain waterbound macadam and gravel roads, or the equivalent of 42,000 mi. of 18-ft. width surfacing. Of this large total, more than 20,000 mi., or about 48 per cent., were of the low-cost surface-treated types and nearly 7,000 miles, or about 16 per cent. of the comparatively low-cost road-mix types. The high-grade standard asphalt types of plant-mix and penetration macadam ran something over 50,000,000 sq.yd., approximately 4,500 mi. or about 11 per cent. Thus the low-cost types made up more than 64 per cent. of the total improved.

A study of returns from 48 state highway departments shows a significant gain in the comparatively low-cost road-mix or mixed-in-place types, even on main routes, this one type with nearly 66,000,000 sq.yd. showing a tremendous gain over 1930.

First among all the states in total yardage surfaced and treated was Pennsylvania with 60,688,620, followed by Minnesota with 29,146,873, Wisconsin third with 22,748,000, Indiana fourth with 17,066,854, and Louisiana fifth with 16,643,616.

Omitting surface-treated yardage and considering only the new surfaces laid, Louisiana leads with its 16,643,616 sq.yd. Illinois continued to pin its faith to concrete with 10,637,000 sq.yd. of that type, but Indiana turned sharply to the less expensive types with 6,500,000 sq.yd. of roads mix and 6,700,000 sq. yd. of surface treatment against 3,900,000 sq.yd. of concrete. Wisconsin showed a particularly well-balanced program, utilizing penetration macadam, surface treatment and standard asphalt and concrete for an impressive total of nearly 23,000,000 sq.yd. of modern surfaces; Texas coming second with 14,000,000 followed by Ohio third with 12,000,000 and West Virginia fourth with 9,000,000.

Among the leading counties Winnebago, Illinois, reported an impressive program of 1,267,200 sq.yd. of concrete and 1,113,000 sq.yd. of the asphaltic surfaces, while Los Angeles County, California, reported 2,170 000 sq.yd. of the asphaltic types and 153 000 sq. yd. of concrete. Jefferson County, Kentucky, reported a great program of surface treatment amounting to 3,850,000 sq.yd., while Ulster County, New York, took its place in the sun with 2,807,000 sq.yd. of new asphalt work. Hamilton County, Ohio, was among the forward ones with 1,801,000 sq.yd. of asphaltic work and 146,000 sq.yd. of concrete. Jefferson County, Wisconsin, completed an extensive surface treatment program of 2,750,000 sq.yd. and added 495,000 sq.yd. of road-mix type to its paved area.

Conventions *(From page 13)*

ing job will be discussed. The present continuation of the highway program is being threatened by a misinformed public opinion and it will be the job of the related highway industries participating in the Congress to focus attention upon the economic phases of road building and to oppose the clamor being heard in some quarters for a moratorium on constructing these needed arteries of commerce.

Friday, January 20, will be devoted to general building. Problems of the building industry of the future will be discussed, as well as the many problems confronting the industry in connection with the employment of funds provided for in the Relief Bill recently passed by Congress, the execution of which is now in the hands of the Reconstruction Finance Corp.

Files Suit to Dissolve Gravel-Rate Injunction

The Mississippi Railroad Commission has entered suit seeking to dissolve an injunction which seeks to prevent putting into effect a lower rate on sand and gravel which was ordered by the commission to go into effect on July 15. An injunction against the application of the lowered rates was secured by the Gulf, Mobile & Northern Railroad in conjunction with other roads in Mississippi. This has held up the new rates. A decision on the temporary injunction is expected soon.

California Producer Is Victim of Heart Attack

Adolph W. Stremmel, vice-president of the Basalt Rock Co., of Napa, Cal., died suddenly August 2 at his home in Vallejo, Cal., following a heart attack. He was 57 years old and was a native of St. Louis, Mo., but had lived in California for the last 30 years.

Mr. Stremmel was one of the original directors who organized the company eight years ago and, at the time of his death, was reported to be its largest stockholder. The widow and one son survive.

Road and bridge construction work in Illinois, totaling approximately $250,000, has been approved by the state department of public works and buildings at Springfield, Ill. Eleven counties will share in the work. Improvements of 35.74 mi. of county and secondary roads and three county bridges are involved.

Upholds Decision in Nebraska Rate Case

FREIGHT CARRIERS DEFINED

The term, "freight rates" in state highway contracts applies to truck as well as railroad rates, the Nebraska Supreme Court has ruled.

Its decision came in affirming an order of the Lancaster County District court denying the right of the state of Nebraska to deduct certain sums from the Lyman-Richey Sand & Gravel Co. of Omaha, payments for state contracts.

The state sought to deduct the amount of railroad freight reductions on shipping gravel under terms of a contract permitting such reductions if "freight rates" are reduced after award of any highway contract.

The Lyman-Richey company went to court to prevent the reductions, claiming that it had based its bids to contractors on truck rates for shipping which were far lower than the old railroad rates. When the railroad rates were reduced, it moved the gravel by rail instead of by truck, although the rail rates were said to be still slightly higher than the truck rates used to make bidding estimates.

The company claimed that if the state was permitted to make the deductions, it would be an actual loser.

The action became a controversy as to whether there is any such thing as truck "freight rates." The state claimed and was supported in its contention by the state railway commission, that there are no regular truck rates. The gravel company, brought numerous truckers to the stand to justify its claim that trucks have "freight rates" as well as railroads.

The Supreme court held that in construing a contract with doubtful provisions, the court must endeavor to place itself in the positions of the parties involved. A contract should also be construed more strictly against the party drawing it, the court ruled.

Judge Paine, who wrote the opinion, held that the "clause in controversy in the contract would not apply unless there was an actual saving or an actual loss to the contractor by a change in the freight rates. The purpose of this clause was to be equity between the state and the contractor."

May Open Road Quarry Near West Point, Miss.

Highway engineers are making tests of lime rock in Clay County, near West Point, Missouri, to decide whether it can be used profitably as a base for road building. If it shows up in a satisfactory way West Point business men expect to open up quarries at once to provide for present demands in road projects.

New Cement Packing Plant in North N. Y.

BUILT AT OSWEGO BY HURON

A new packing and bulk-cement plant is being completed at Oswego, N. Y., by the Huron Portland Cement Co. of Detroit, Mich. The plant, which will be served by the company's self-unloading steamers will load and pack cement for distribution through that territory, where the company has taken a road-building contract.

The steamer *John W. Boardman*, one of the company's fleet of self-unloaders, arrived at the new dock recently with the initial cargo of 8,000 tons. In order to facilitate movement of the vessels to the plant a channel 100 ft. wide was dredged by the Great Lakes Dredge & Dock Co. Automatic baggers made by the Bates Valve Bag Co. have been installed to package the product. A 300-bbl. hopper has also been installed, according to P. H. Townsend of the Huron company.

Both motor trucks and the railroads will be used to distribute the material, trackage having already been laid to the waterfront location.

Death Takes N. Y. Sales Manager for Penn-Dixie

Frank Petry, metropolitan sales manager for the Pennsylvania-Dixie Cement Corp., died suddenly from a heart attack at Hackensack Hospital, Hackensack, N. J., August 8, 1932. He was 46 years old.

Mr. Petry was widely known in the construction field through his activities in the cement industry with which he has been connected for the past 21 years. He was a member of the Builders' Art Club, The Uptown Club and the Hackensack Golf Club. Mr. Petry is survived by his wife and a sister.

Dan R. Long has been appointed to fill the vacancy caused by the death of Mr. Petry. Mr. Long has been with the Penn-Dixie selling organization for several years. Previous to that time he was connected with the Atlas Portland Cement Co.

Hersey Gravel Co. Will Rebuild Damaged Plant

Rebuilding of the plant of the Hersey Gravel Co., at Evart, Mich., will probably go forward shortly, according to George Glerum, president.

The plant was almost totally destroyed by fire, a short circuit in the electric wiring being blamed as the cause. The loss was placed at $50,000.

30-Hour Week in Effect in Wisconsin Road Work

All public works under supervision of the state departments of Wisconsin will be constructed on a 5-day week and 6-hr. day basis, the state unemployment commission has announced after a conference of department heads. The rule will apply not only to highway work financed by federal funds but to all construction work paid for by state funds whether under contract or by day labor, it was stated.

It was further provided that work will be given to *bona fide* residents of Wisconsin and emergency employment will be staggered so as to give work to as large a number as possible.

The commission stated that action taken is in conformity with the general policy followed during the last 16 months in the conduct of public works under its direction.

Alabama Graphite Mines Acquired by New Group

The properties of the Alabama Pocahontas & Queenelda Graphite Companies, of Birmingham, were purchased recently by a group of New York and Chicago promoters who announced that operations at the graphite mines and smelter in Clay County, Alabama, would begin in about 60 days.

Men are already busy getting the machinery and mines ready for operation by the new company. Included in the group of men making the purchase are B. F. Dudley, Adolph Stamer and a son of former Gov. Jackson, of Iowa.

California Quarry Has Buildings in Progress

Thirty men are being employed at the Declez Quarry at South Fontana, Cal., in the construction of a number of new buildings, to cost $10,000, according to Carl Bradley, superintendent.

One of the buildings is to serve as a plant office, another will house the machine and blacksmith shops and power-plant equipment, while two new powder magazines will be used to store explosives.

The largest blast ever set off by the concern was recently detonated in the quarry.

$19,926 Refund Sought from Y. & M. Railroad

The Parker Gravel Co., Inc., of Shreveport, La., recently petitioned the Louisiana Public Service Commission to order the Yazoo & Mississippi Valley Railroad to reimburse the company with $19,926 with interest for construction of track connections used in transporting 4,920 cars of sand and gravel from the company pits.

The company states that they constructed switching facilities which the roailroad should have built and claimed that such service had been rendered other companies, thus showing discrimination. The company asks reimbursement of $4.05 per car.

Texas Cuts Concrete Paving Costs in Two

MAINTENANCE ALSO REDUCED

During the 4-yr. period ended August 31, 1931, there was expended under the direction of the Texas Highway Commission for road construction, maintenance and administrative affairs of the department $158,044,336, according to a state auditor's report. Revenue received by the department during that period totaled $166,183,-224, of which $64,610,419 came from federal aid; $69,756,152 from gasoline sales tax; $30,871,766 from automobile license fees, and the balance from depository interest and miscellaneous sources.

The unit cost of concrete pavement declined from $2.34 a sq. yd. in 1926 to $1.18 in the last period. The average cost a mile of maintenance was $546.50 in 1930, and $458.12 in 1931.

Administrative and office expenses appropriated in legislative budget, totaled $2,814,165, miscellaneous expenses, including costs of highway motor patrol and refunds of motor bus seating tax, $833,513; maintenance of highways and cost of construction work done by maintenance division of the department, $47,624,393, cost of construction projects, $106,772,273.

Demand for Lime Spurs Activity at This Plant

The plant of the Auburn Chemical & Lime Co., near Roseville, Cal., is the scene of greater activity than ever before due to the demand for lime by mining companies who use the product in their cyanide plants.

Two years ago the company started operations with a view to selling to the sugar-beet industry. The lime proved unsuitable for this use, but the increased interest in gold mining resulted in a demand for the product from an unexpected source.

Charles Kemper is general manager of the company, Sidney Holt is sales manager and J. H. Andregg is superintendent. The company was formed two years ago, Placer County business men subscribing $25,000 to begin operations.

Concrete Products Men Hold Outing on Pacific

More than 50 cement-products producers and their friends attended the annual midsummer meeting and outing of the Northwest Concrete Products Assn. at Pacific Beach, near Aberdeen, Wash., on August 19 and 20.

The invitation to hold the meeting at Pacific resort was extended by Earl Bracken, head of the Grays Harbor Cement Products Co. W. P. Hughes of Yakima, Wash., has been president of the organization during the past year.

Editorials

The Single-Show Idea Becomes a Reality

THE fact that several of our industries' most important trade associations have decided to participate in the Highway and Construction Congress of next January, as reported in our last issue, supplies a fresh instance of the sanity that characterizes the current policies of those bodies. Although the economic situation played a part in shaping those policies, in so far as they are concerned with the concurrent-convention and single-show idea, this fact does not in any way detract from the credit that is due the directors of those organizations for the intelligent manner in which they approached and solved the problem. Had they allowed a mistaken sense of individual importance or group egotism to dictate their decision, the congress which is now a certainty would have remained a mere project.

Every trade-association director who voted in favor of the joint congress deserves praise for his courage, his vision, and his ability to submerge the common and normal feeling of his own group's individuality in the larger and more important ends which the congress will achieve. Each one is to be applauded, too, for approving a plan by which each group will preserve its individual identity through separate meetings and by which the interests common to all groups will be served through a single show and through joint sessions to be held on the last two days of the congress. The unanimity with which the decision to approve the idea was made in all the groups involved is a tribute to the directors' unselfishness, to their devotion to liberal standards, and to their willingness to take the large and generous, rather than the small and illiberal, view of the problems that affect all industries alike.

The new congress has great possibilities. As we pointed out some months ago, it will provide for the construction industries the first public evidence of the existence of a united group, which renders a common service to the nation and contributes through conjoined effort to the economic development of the country. If the mere prospect of such a gathering has been impressive, the reality must be much more so. For the first time public attention will be focused on the important but too often overlooked fact that all the industries to be represented are interlocking parts of a great national construction movement, which has given us the world's greatest example of highway and building development. The congress will have the no less important effect of making the participants themselves fully aware of an interdependence and community of interest which, while it has always existed, has seldom been recognized or properly appraised. It will attract thousands of material producers, contractors, highway officials and others interested in highway and building construction, some of whom would not otherwise have been interested in, or able to benefit from, the important meetings and exhibits.

The congress will appeal with new force to makers of machinery and supplies for they will see in it an unprecedented opportunity to show the important developments which their engineering departments have brought forth in the last few years. Those who may fail to avail themselves of the possibilities which such a gathering and display afford will show marked indifference, not alone to the importance of the congress and its effect on public opinion, but to their own commercial interest as well. In view of the economy that will be made possible by holding one show instead of two shows, exhibitors will have less reason than ever before for withholding their support, while, because of the unusually large attendance that can be counted on as a practical certainty, they will have more reason than ever before for participating in it. Manufacturers who may never have exhibited at any of the shows of the material-producing industries, because of what they may have considered the high cost and limited attendance, have the rare opportunity of making their first appearance at a time when low cost and large attendance make the advantages exceptional. Participation in the show will introduce such manufacturers to several important industries —the crushed-stone, the sand-and-gravel, and the ready-mixed-concrete, to name a few—whose need for efficient machinery is pressing and whose buying power, because of their high relative stability, is greater than that of many other industries which in the past may have seemed to offer more attractive opportunities.

The coming congress is the result of the continually growing conviction on the part of producers in our industries that the interests common to all separate industries embraced in the term "construction industries" are superior to those lesser interests that are peculiar to individual groups. It gives tangible expression to the feeling that these groups have more common interests than divergent or opposed interests and that these common interests can be furthered more quickly and more effectively by concerted action than by individual working at cross purposes. We have always shared this view, as is evidenced by frequent editorial comment, and we have repeatedly advocated the same idea of concurrent conventions and a single show which is now to be realized in the Highway and Construction Congress. We are glad that we were able to contribute something to the realization of this plan, both by promoting the idea editorially and by publishing the opinions of interested producers and exhibitors, and we are glad, also, that the pressure of economic circumstances placed the plan's advan-

tages in a more favorable light than might otherwise have been the case. In our opinion, our industries are to be congratulated upon the foresight, the courage, and the good sportsmanship which enabled them to compose the differences of opinion natural to rival interests and to work together for such an important common end. We deem the congress an event of transcending importance to our industries, not only for the immediate gains, which are many, but for the still greater advantages which the acceptance of the idea foreshadows, which we have often discussed editorially, and which we feel certain are bound to come.

Don't Neglect Maintenance

IN times of poor business there is a strong tendency to omit those customary maintenance operations which every manufacturer knows to be essential to efficient production and low cost. When the demand for products falls below the capacity of plants to produce them, and a percentage of plant equipment stands idle, it has become common practice to replace the worn or broken parts of working equipment by taking the needed spares from idle equipment, instead of adding to expense by purchasing new parts. To the extent that this practice reduces expenses momentarily it is doubtless often justifiable, but persistence in it weakens idle equipment to such a point that only a small revival of business is needed to bring that equipment back into use. At the same time it is usual to employ the best equipment in a plant, leaving the oldest equipment in reserve, so that when it becomes necessary to press the latter into service to meet increasing demand it is not only inefficient (because of its age, perhaps), but it is also not in working order, due to the removal of parts for replacement on working equipment. Under such circumstances the management is faced with the problem of installing new parts in machines that are not up to, or anywhere near, the efficiency standards of those parts. The same is true in cases where new equipment is installed, and it is often found that the old equipment, on account of neglect in maintenance, is incapable of playing its part in the revised production plan.

In a recent example of this kind the contrast between the new and the old was striking. A certain plant was being fitted with a new piece of equipment, the installation of which required some changes in the mode of operation of existing equipment. It became necessary to accelerate the speed of certain units and in other ways to adapt the old equipment to the higher efficiency standards of the new. The plant had not been shut down in more than a dozen years and had, therefore, never been thoroughly overhauled, while during the enforced shut-downs of the last two years, when there was sufficient time for overhauling, nothing was done because of the desire to avoid expense. As a result of this neglect, the plant experienced more than 150 enforced shut-downs in 23 days, due to the weakness of the old equipment. Some of the parts of some machines were so weakened from wear that they could not withstand the slightly increased speed of operation necessary to the attainment of the efficiency which the new equipment was intended to effect; in one day five bearing caps broke from the added strains.

While this experience may not be typical, the policy which caused it is all too common. Profitless production, due to price-cutting, has made it almost impossible for many concerns to give adequate time and funds to the demands of maintenance, while in most cases it has made the necessary expenditures seem comparatively unimportant. For all such plants the day of reckoning is near. In the gradual betterment of business noted in many sections of the country there is evidence of increasing activity with its inevitable demands on producing equipment. While the time is still available and while prices are still low it behooves the manager who has neglected maintenance to make good the deficiencies of overeconomical operation and bring his plant up to par. The one who discharges this obligation most thoroughly will be in the best position to produce efficiently and economically when reviving business makes that even more necessary than it is to-day.

Canadian Gypsum Industry Looks to Future With Confidence

Canada continued to be an important exporter of crude gypsum during 1931 although the exports of gypsum products declined somewhat as compared with those of the previous year, according to a review of the gypsum industry by the Dominion Department of Mines, Ottawa. The industry as a whole is in good condition and is looking to the future with confidence, the review states.

Important developments were recorded during the year. Gypsum, Lime & Alabastine, Canada, Ltd., added a number of new commodities to its output, one of which is a gypsum wallboard with a surface finished in reproduction of the graining of wood, and another a precast acoustic tile. The Canadian Gypsum Co., Ltd., placed in operation its new wallboard plant at Hillsborough, New Brunswick, and opened a new plant at Hagersville, Ont. The opening of the latter plant is of considerable interest to the gypsum industry, as it marks the first time in Canada that complete calcination has been carried out in a continuous rotary kiln.

Nova Scotia is the largest producer of gypsum in Canada, followed by New Brunswick, Ontario, Manitoba, and British Columbia. The materials produced are the hydrous calcium sulphate, commonly known as gypsum, the partly dehydrated material, known as Plaster of Paris, or wall plaster, and the anhydrous calcium sulphate, known as anhydrite. Gypsum is marketed in various forms, and an increasing proportion of the calcined material each year enters into the manufacture of wallboard, gypsum blocks, insulating material, acoustic plaster, etc.

Plant of the Saxet Sand & Gravel Co. near Victoria, Tex.

Texas Concern Erects Special Plant to Bolster Production of Ballast

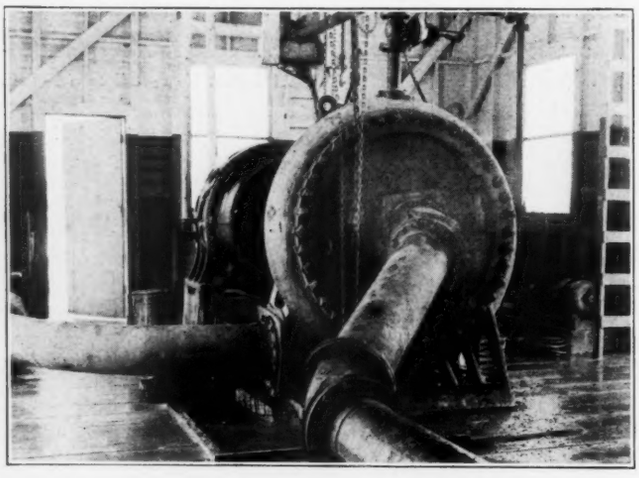
Two Dredges Operate in Unison to Pump Material 2,000 Ft. to Processing Units

ONE of the largest plants in Texas or in the entire Southwest is that of the Saxet Sand & Gravel Co. near Victoria, Tex. This plant, which is now beginning its fourth year of operation, has a capacity of 75 car-loads of washed and graded aggregate and 40 car-loads of ballast in a 24-hr. day. Until recently it has been run almost continuously and has operated 24 hr. per day a large part of the time. Lately, however, the demand has slackened considerably, especially that for railroad ballast.

The plant was put in operation in November, 1928. At that time only one dredge was employed and the plant was used solely for the production of washed and screened aggregates. In 1929 the demand for railroad ballast caused the erection of a ballast plant alongside the original operation. A second dredge was purchased to insure an adequate supply of material for both plants.

The plant is located in the bottom of Guadalupe River, about 2½ mi. west of Victoria. It is on Texas State Highway No. 12 and on a spur line from a main line of the Missouri Pacific Ry. The 600 acres of gravel deposit owned by the company has an average of from 5 to 15 ft. of overburden, but no stripping has yet been necessary, as all operations have been conducted where the overburden is lightest. As dredging is being carried on to a depth of 45 ft. and the overburden is light and friable material, it has been caved in with the gravel without giving any serious trouble.

The main dredge, showing a portion of the ladder.

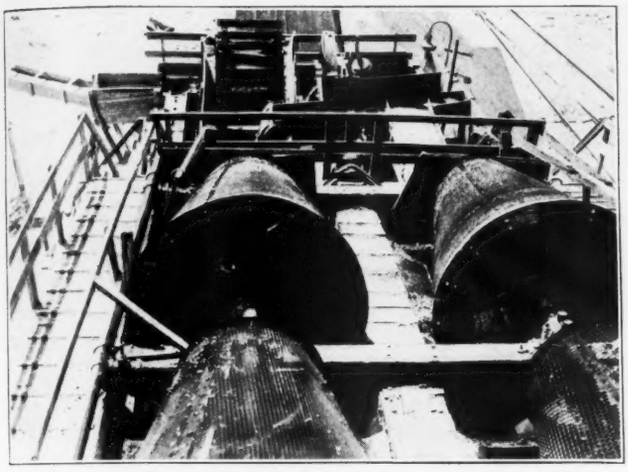


The 10-in. pump on the main dredge.

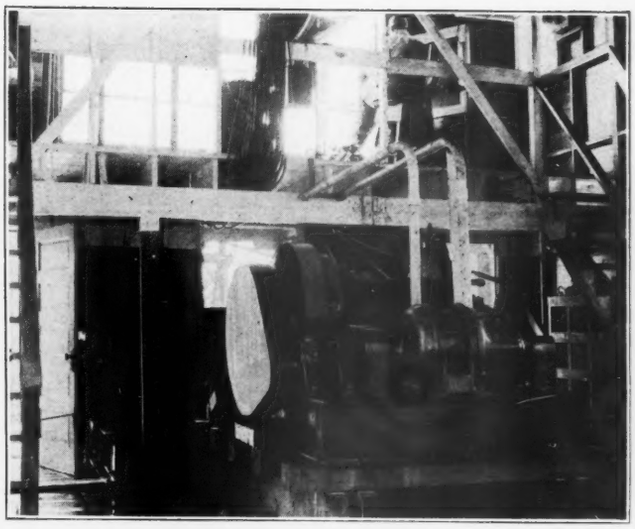
Good gravel is known to exist to a depth of more than 80 ft. Very little of the deposit is above water level. The material averages from 40 to 45 per cent. sand. Less than 5 per cent. of the gravel is over 2½ in. in size, and none of it exceeds 5 in. in size. The material consists of siliceous gravel and extremely hard and pure silica sand. Later, when heavier overburden is encountered, it will be removed by a drag-line and hauled away by trucks or a locomotive and cars.

Although the two dredges first operated separately, they now work in unison, dredging being done over 2,000 ft. from the plant. The newer of the dredges excavates the material and pumps it a distance of about 1,000 ft. to the second dredge, which is now being used as a "booster" and moves the material another 1,000 ft. and elevates it 30 ft. to the scalping screen.

The first dredge has a hull composed of nine steel pontoons and a 70-ft. Diamond cutting ladder supported from a structural-steel framework integral with the hull. Two large and four small steel pontoons support the ladder. The superstructure of the dredge is of wood. The 10-in. Diamond dredge pump is driven by a direct-connected 400-hp. Allis-Chalmers electric motor, a flap-valve protecting the pump from material backing up in the line. A 3-drum Clyde hoist, driven by a 15-hp. Lincoln motor, raises and lowers the ladder and handles the two shore-lines. A 2-in. Allis-Chalmers centrifugal pump driven by a 7½-hp. motor of the same make is used for priming the dredge pump. The ladder is operated by a 25-hp. Allis-Chalmers motor. The operator is at the front of the dredge and has all controls within easy reach. The "booster" dredge is exactly the same in every detail except that it has a 50-ft. Diamond cutting ladder, which is not in use. Cincinnati Rubber Co. suction hose and Cincinnati and Goodyear dredge sleeves and flexible couplings are used. Power is brought to each dredge at 2,300 v. by submarine cable and is reduced to 440 v. for the smaller motors. The dredge-line is supported on pontoons, each consisting of 12 oil barrels.



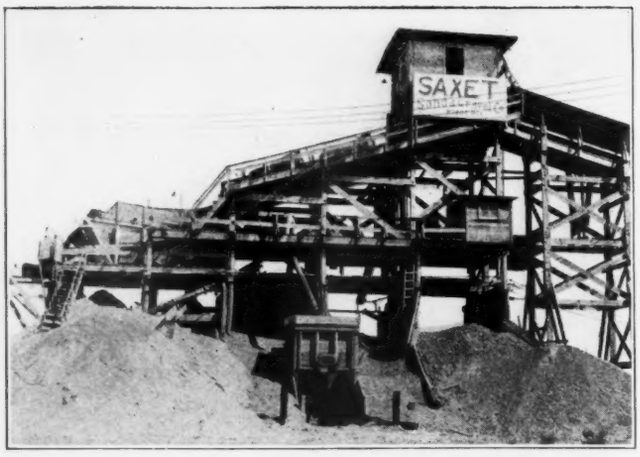
Screens and sand-washing equipment.



Three-drum hoist which controls ladder and shore-lines from the dredge.

The dredge-line discharges at the plant to a 48-in. by 12-ft. revolving scalping screen provided with 2½-in. openings. This is driven by a 15-hp. Allis-Chalmers motor through Link-Belt silent chain. The oversize from this screen goes to a 24-in. inclined belt-conveyor which runs on 91-ft. centers and discharges to a hopper that feeds either an Allis-Chalmers 6-in. Superior McCully or Allis-Chalmers No. 7 Newhouse crusher or both as desired. The former is generally set for 2½-in. and the latter for 1½-in. material. The Newhouse crusher is direct-driven by a 50-hp. motor and the McCully crusher by a 60-hp. Allis-Chalmers motor

Pipe-line to the booster dredge with plant in the background.



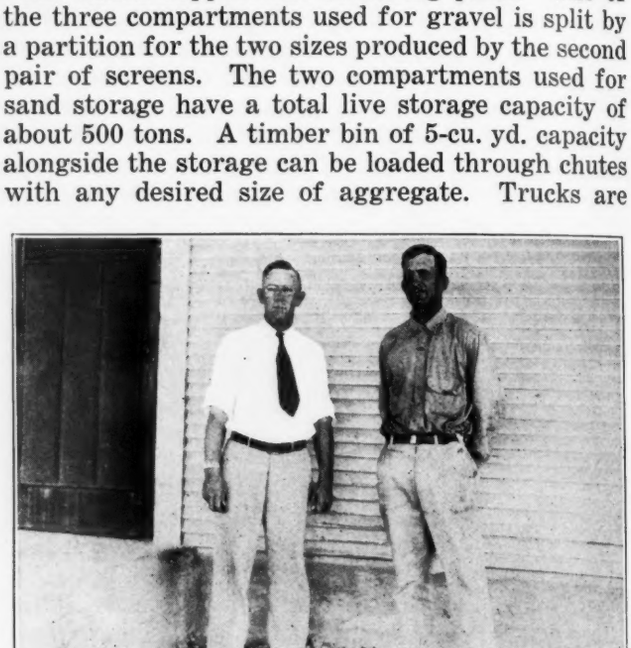
Screening building, showing sand-drags at left and truck-loading bin.

through a belt drive. Both crushers discharge to a 24-in. belt-conveyor leading to the ballast-screening plant, which is not in use at present. A temporary chute from the end of this conveyor takes the crushed gravel to a dewatering sump. The ballast plant has two conical screens over a 2-compartment 350-ton steel bin, from below, which belt-conveyor carries the material to a loading building.

The material passing through the scalping screen goes through a steel-lined flume to the 10-ft. by 20-ft. dewatering sump, from which the gravel and crushed gravel are recovered by a 30-ft. Link-Belt dredging elevator fitted with 30-in. by 12-in. by 18-in. perforated buckets. This is driven by a 40-hp. motor through silent-chain. The elevator feeds a 150-cu. yd. surge hopper which discharges on a 30-in. inclined belt-conveyor running on 205-ft. centers to the top of the main screening plant and driven by a 40-hp. motor through silent-chain. This conveyor discharges through a split chute to two sets of three 6-ft. by 72-in. by 96-in. Link-Belt conical screens. The first pair has 1½-in. perforations. Of the second pair, one has ¾-in. and the other 1¼-in. openings. The third pair has 5/16-in. openings. The various sizes of gravel produced go to storage.

The fine material from the last pair of screens passes through a single flume to one of two 6-ft. by 24-in. Diamond sand-drags. A flat screen section with ⅛-in. openings in the bottom of this flume feeds the fine-sand classifier. The material passing over this screen goes to the coarse-sand classifier. Both sizes go to separate storage compartments. There is usually an excess of fine sand and this, with the silt and water, is flumed to a worked-out section of the dredge pond near the plant, where it can later be reclaimed if desired. Each set of screens is driven by a 30-hp. motor through Link-Belt silent-chain and gear.

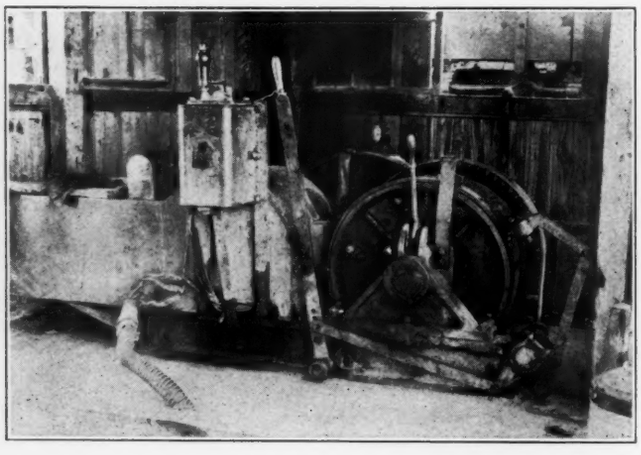
The storage-bins are of the open-end ground-level type and are separated by six timber partitions which support the screening plant. One of the three compartments used for gravel is split by a partition for the two sizes produced by the second pair of screens. The two compartments used for sand storage have a total live storage capacity of about 500 tons. A timber bin of 5-cu. yd. capacity alongside the storage can be loaded through chutes with any desired size of aggregate. Trucks are backed up to this bin and loaded through an inverted segmental gate.



H. T. Brewster, plant manager, and Supt. H. M. Crain.

Ten gates in the roof of a 7-ft. by 7-ft. concrete tunnel under the five storage compartments feed a 30-in. tunnel belt-conveyor which is driven by a 40-hp. motor. This conveyor operates on 240-ft. centers, is horizontal in the tunnel, and inclines to the car-loading bin, which is a timber structure with two gates so located that only three "spots" are necessary in loading a car. A 4-ft. by 7-ft. stationary screen with ¼-in. openings was recently installed over this bin. A spray gives the material being loaded a final rinse over this screen. A flume takes the fine material and water to the dredge pond.

A Clyde 1-drum hoist, driven by a Lincoln 15-hp. motor, "spots" cars for loading. Cutler-Hammer electrical equipment and Allis-Chalmers electric motors are used throughout the plant. The Link-Belt Co. furnished all the elevators, conveyors and screens. Conveyor belting is divided between two brands, Cincinnati and Goodyear. American cable is used on the dredges and at the plant. The plant



Hoist which "spots" cars for loading.

(Continued on page 29)

Concrete Sold on Strength Specification Only at This Plant in Indiana

Wide Acceptance of Product Is Achieved After Single Year of Operation in Field

By W. E. TRAUFFER

SALES of ready-mixed concrete by strength specifications are becoming more and more prevalent as producers and their customers become aware of the many advantages of this method of specification. Many of the larger and more progressive producers, in fact, will sell concrete only in accordance with strength specifications. This, of course, is possible only where the important users of concrete approve this method. It now seems to be only a question of time before most of the concrete sold will be strength-specification concrete.

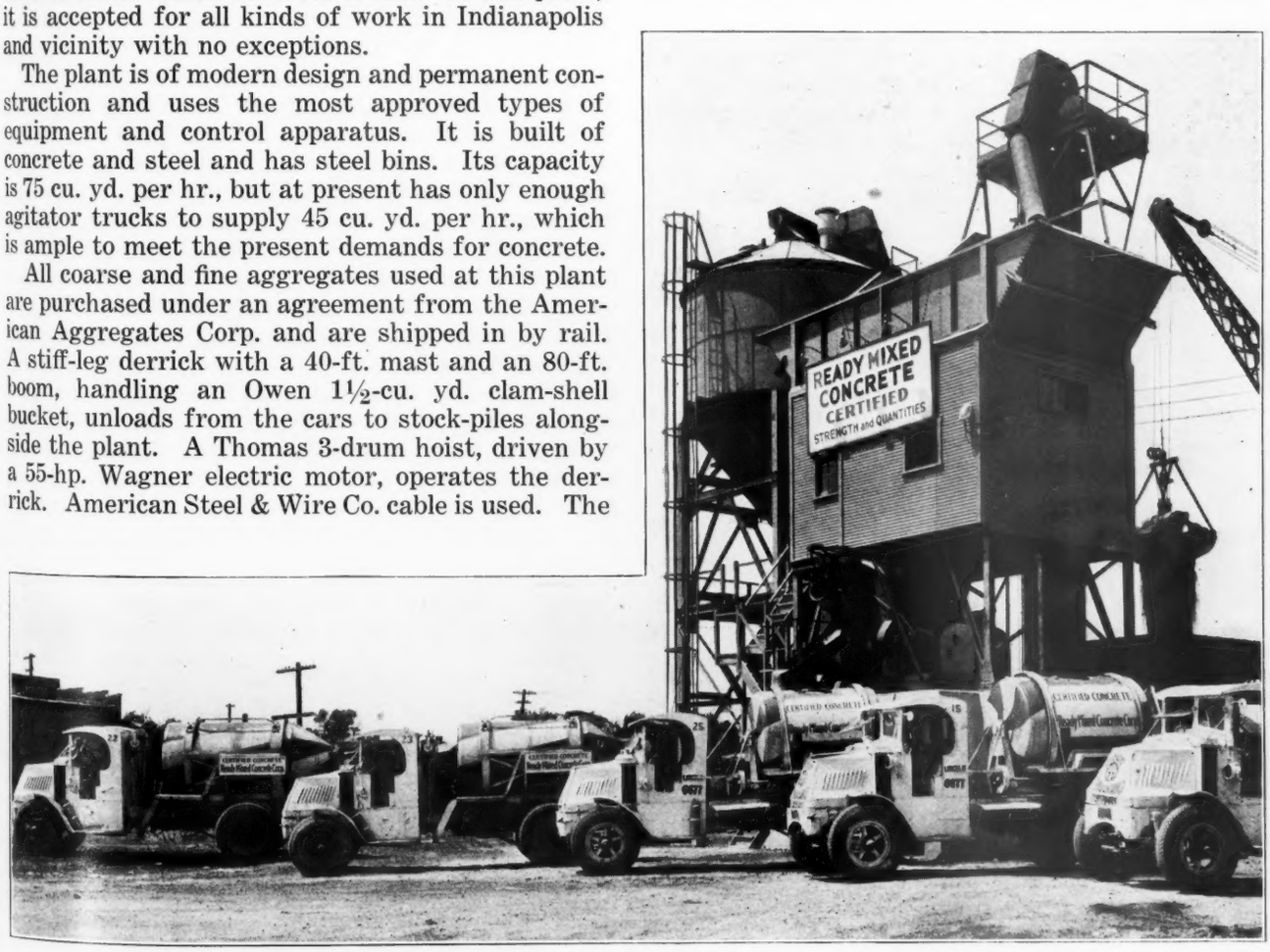
One of the growing number of plants which sell on strength specifications only is that of the Ready Mixed Concrete Corp., at Indianapolis, Ind., which went into operation on July 1, 1931. This company goes even a step farther, as it certifies all concrete with a strength of 3,000 lb. per sq. in. or more. The lowest strength concrete produced at this plant is 2,000-lb. As a result of these facts and the rigid control under which concrete is made at this plant, it is accepted for all kinds of work in Indianapolis and vicinity with no exceptions.

The plant is of modern design and permanent construction and uses the most approved types of equipment and control apparatus. It is built of concrete and steel and has steel bins. Its capacity is 75 cu. yd. per hr., but at present has only enough agitator trucks to supply 45 cu. yd. per hr., which is ample to meet the present demands for concrete.

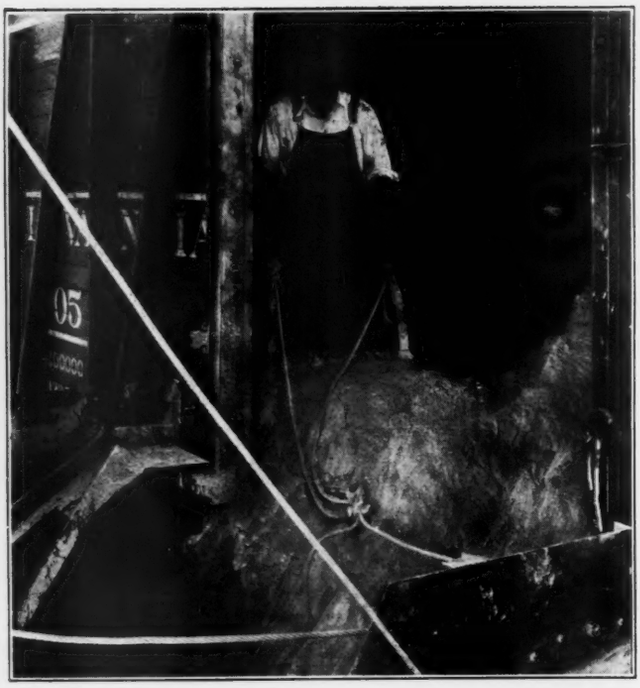
All coarse and fine aggregates used at this plant are purchased under an agreement from the American Aggregates Corp. and are shipped in by rail. A stiff-leg derrick with a 40-ft. mast and an 80-ft. boom, handling an Owen 1½-cu. yd. clam-shell bucket, unloads from the cars to stock-piles alongside the plant. A Thomas 3-drum hoist, driven by a 55-hp. Wagner electric motor, operates the derrick. American Steel & Wire Co. cable is used. The stock-pile has a capacity of 50-cu. yd. each of concrete sand, ¼-in. to 1-in. gravel, and ¾-in. to 1½-in. gravel.

The derrick can handle materials either direct from cars or from the stock-piles to a 20-cu. yd. steel hopper. A plate-feeder carries material from this hopper to the boot of a steel-inclosed chain-bucket-elevator which discharges through a movable spout to storage-bins at the top of the mixing plant. The elevator operates on 40-ft. centers and is driven through roller-chain and a speed-reducer by a 15-hp. motor. The feeder is chain-driven from the tail pulley of the elevator. The aggregate bin is of steel and has three compartments with a capacity of 50 tons each.

Cement is received by rail in bulk and is unloaded with a power shovel to the boot of another steel-inclosed bucket-elevator. This operates on 50-ft. centers and discharges to a horizontal screw-con-



The plant in Indianapolis, with a few of the trucks in the foreground.



Power scoop handling bulk cement from box car.

veyor, which empties by means of a flop gate to either of two 400-bbl. compartments in the circular steel cement-storage bin. The cement-feed elevator is driven through a worm-gear speed-reducer and roller chain by a 10-hp. motor and the screw-conveyor is driven from the same motor. The power shovel is driven by a 5-hp. motor.

Cement is fed from the bin through either of two 14-in. rotary valves to a 12-in. screw-conveyor which is slightly inclined and discharges directly into the 2,000-lb. cement-weighing batcher. This has a single-beam Fairbanks scale and a tell-tale dial to insure accurate measurement. The aggregates are fed through three clam-shell gates, one for each bin compartment, into the 2-cu. yd. aggregate-weighing batcher. This has a 3-beam Fairbanks scale and a tell-tale dial. The water used in the mix is taken from the city mains and is measured by Ransome 250-gal. siphon-type tank. The cement-feed screw is driven by a 7½-hp. motor through a worm-gear speed-reducer.

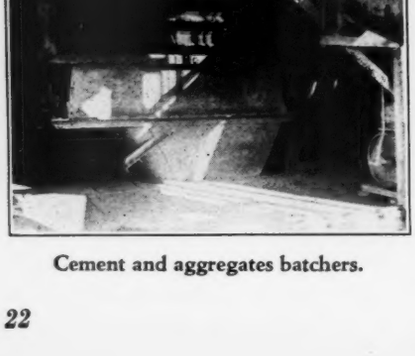
The cement batcher discharges through a spout into the bottom of the aggregate batcher in such a manner that, as the aggregate is discharged, the cement is drawn out and mixed with it. The cement batcher discharges through a sliding gate and the aggregate batcher through a tilting gate, both gates being controlled from the batching floor. All materials are discharged to the Ransome 56S concrete mixer, which is driven by a 40-hp. motor. Concrete is discharged from the mixer through a movable spout into the agitator trucks, the spout being put into position by the truck driver.

At present the company operates 8 agitator trucks. Three of these have Jaeger 4-cu. yd. bodies and two have Transit Mixer 4-cu. yd. mixer bodies which have been converted into agitators and have had their water-tanks removed. All these bodies are mounted on Mack 5-ton truck chassis. The three other trucks have Smith 2-cu. yd. agitator bodies mounted on Omort chassis. All the trucks have pneumatic tires with dual wheels in the rear.

Left to right: Ralph Heady, manager; A. Lankam, mixer engineer; J. T. Baggett, derrick engineer; and R. Norton, control engineer.

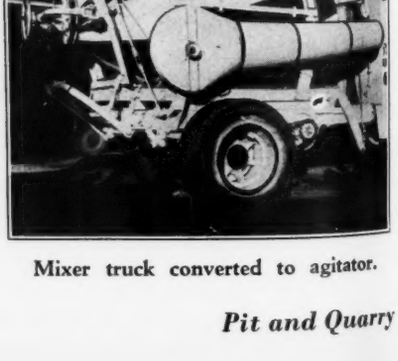
The company expects to use a total of from 12 to 15 trucks eventually when conditions warrant operation of the plant at full capacity. To facilitate movement of the trucks about the plant and yard a total of 1,350 sq. yd. of concrete drive 8-in. thick has been laid.

The plant was designed by the Blaw-Knox Co., which furnished all the bins, hoppers, and weighing batchers. All the screw-conveyors, bucket-elevators, drives, speed-reducers, and the plate-feeder were furnished by the Link-belt Co. Herco-Nordstrom valves are used on the water-lines to insure against leakage at the water-measuring tank. With one exception all electric motors are Fairbanks-Morse, and Cutler-Hammer push-button switches

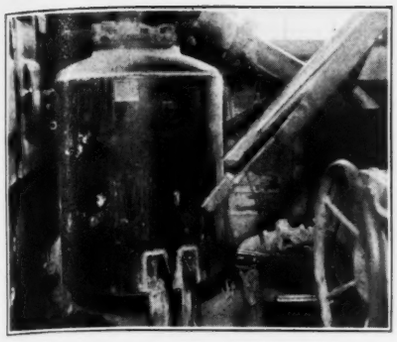


Cement and aggregates batchers.

Aggregates elevator and discharge spout.



Mixer truck converted to agitator.



The 250-gal. water-measuring tank and control valves.

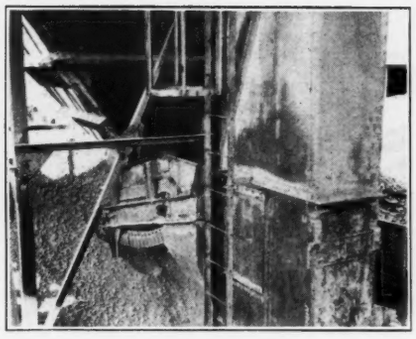
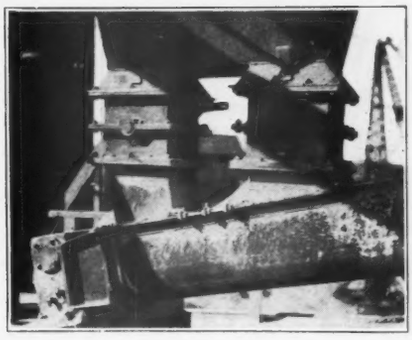


Plate-feeder handling aggregates from hopper to elevator.



Rotary valves feeding cement from bins to screw-conveyor.

control all operations from the batching floor. A telephone connects the operator with the plant office, which is a wood-frame building near the plant. Two ventilators provide aëration of the cement bins, and a small Kellog Mfg. Co. air-compressor and tank furnish air for fluffing the cement to keep it from sticking in the bins. All exposed motors have ventilated covers.

As was previously stated, the concrete produced at this plant is accepted for all purposes. It has been used for street, sidewalk, general construction, utilities, street-car, and some railway work. Concrete was delivered a distance of 10 mi. to the new

Stiff-leg derrick and bucket handling aggregates to hopper.

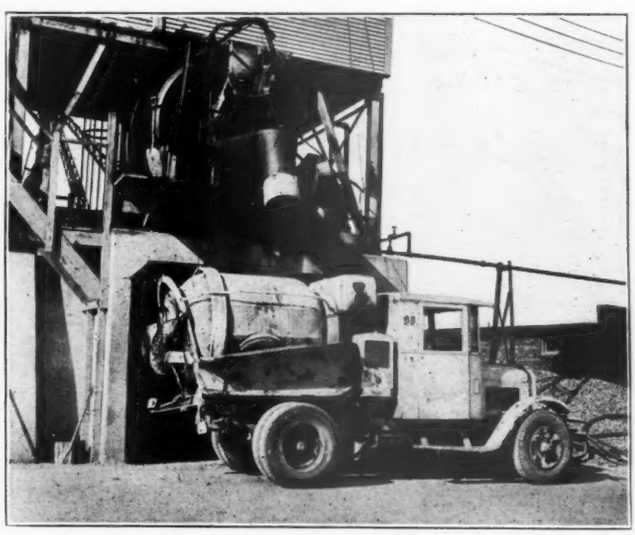
airport recently built; 2,600 cu. yd. was used in the new state highway building; and some of the concrete was also furnished for the new Indianapolis post-office. The concrete is used for city, state, county, and government work. The city now specifies ready-mixed concrete as an alternate on all bids advertised and all contractors must submit bids on both ready-mixed and job-mixed concrete.

All concrete furnished to the city for paving is sold on a penalty basis, but this has been no handicap as only 2 per cent. of the concrete supplied to the city since the plant went into operation has been below the specified strength and that only slightly. During the same period 32 per cent. of the job-mixed concrete ran below the specified strength. The city uses 2,000-lb. concrete for asphalt base, and 3,500-lb. concrete for curbs, sidewalks and pavement. Of approximately 20,000 cu. yd. of concrete produced by this plant in the first six months after it went into operation about half was sold to the city.

Ernest A. Hagy, consulting engineer of Cincinnati, O., an engineer of wide experience in the ready-mixed-concrete industry and construction work, is retained as consulting engineer by the company. Mr. Hagy keeps a man at the plant at all times to make all the usual tests and to check all operations to insure the production of concrete of the strength desired. Mr. Hagy also meets architects, engineers, and contractors personally to inform them of the advantages of predetermined-strength concrete, and of the savings that are made possible by working close to strength, a condition that is easily met by the close control under which the concrete is produced. The company, through Mr. Hagy, offers an engineering service with all concrete orders of any size. Coöperation with architects and engineers makes possible the use of the A. C. I. Joint Code No. 28, which permits the use of high-strength concrete with its resultant saving in construction costs and space.

Ample provisions are made for heating the concrete for cold-weather operation. Steam is furnished by a 40-hp. upright boiler in a shed near the

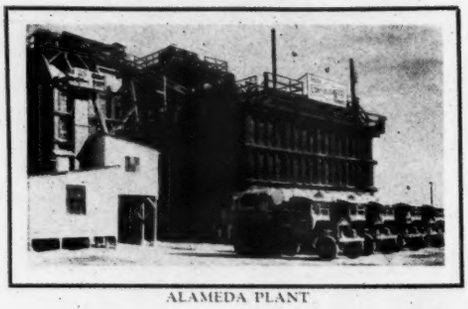
(*Continued on page 29*)



One of the 2-cu. yd. agitator trucks ready to be loaded.

READY MIXED CONCRETE IS HERE!

BETTER



CONCRETE

ALAMEDA PLANT

Consolidated Rock Products Co. . . . *Announcing* . . .

1. Fleet of twenty-five trucks at your disposal.
2. Plants conveniently located throughout the district.
3. No order too large or small with immediate deliveries.
4. Accurately mixed concrete delivered in truck mixer bodies.
5. Commercial deliveries in quantities from one to four cubic yards.
6. For quick action telephone TRinity 0241 . . . . .

A new service in the construction field.

for BUILDING MATERIALS

CRUSHED ROCK
GRADED GRAVEL
SAND
CEMENT
PLASTER
SUPPLIES FOR MASONS & PLASTERERS

CONSOLIDATED ROCK PRODUCTS CO.
BUILDING MATERIALS
656 So. Los Angeles St., Los Angeles

Start the Big Orange Trucks YOUR way

Take advantage of the Service and Quality Consolidated Rock Products Company can show you. Consolidated Rock's size and resources are your guarantees of *lower cost per ton of material delivered*...and of immediate and personal attention to small or large orders. Phone TR 0241 today . . . . . Start the *Big Orange Trucks* YOUR way . . .

TRINITY 0241 for . . .
Crushed ROCK—SAND
Graded GRAVEL—LATH
LIME PUTTY—STUCCO
CEMENT—PLASTER
REINFORCING STEEL
MIXED MORTAR

CONSOLIDATED ROCK PRODUCTS COMPANY
656 So. Los Angeles St. • Los Angeles, Calif.

CONSOLIDATED ROCK PRODUCTS COMPANY

Offers a New Concrete Service

Better Concrete at a Lower Cost

CONSOLIDATED ROCK PRODUCTS CO.
READY-MIXED CONCRETE

MAIN OFFICE: 656 SOUTH LOS ANGELES STREET LOS ANGELES, CALIFORNIA PHONE: TRINITY 0241

Mailing piece, blotters and trade-journal advertising used by the Consolidated Company.

How the Consolidated Rock Products Co. Develops Sales for Materials

Rigid Assignments, Personal Contact and Suitable Printed Forms Help Do the Job

By R. B. PARKS

TEN years of conscientious study and repeated revisions to meet growing needs have gone into the perfecting of the lead envelopes and follow-up forms of the Consolidated Rock Products Co. of Los Angeles. Walter Moore, Jr., general sales manager of the firm, has made these forms his personal study with the result that they are considered the most effective in this line of business to-day.

Due to the limitations put upon the Consolidated Rock Products Co. by the district which it serves —the economical necessity requiring a short haul to the job which it services—the firm does practically no direct-by-mail advertising. All the business of the sales department is done through personal contact. Even telephone inquiries are answered by sending a salesman to the prospective customer. So, in a discussion of the selling methods of this company the emphasis falls naturally on its method of handling salesmen rather than on its advertising. A short paragraph will suffice to give a clear insight into the latter operation.

A price-list is mailed to all customers and prospective customers whenever changes in current market prices make such a list necessary. Blotters, Mr. Moore finds, provide an excellent way in which to keep the firm's name before prospective customers. Broadsides informed the building public that Consolidated Rock Products Co.'s new ready-mixed concrete service was at their disposal. The firm issues no house organs and sends out no sales-promotion letters, but it distributes every year between 6,000 and 7,500 calendars showing pictures of its plants and equipment. Advertising space in the local trade journals is bought regularly, while the company's advertising in the daily newspapers consists for the most part of write-ups of its outstanding jobs, and there are the usual "policy ads" that all firms find necessary at times.

The sales department of Consolidated Rock Products Co. employs 20 salesmen, each of whom has his own district in which to work. Under glass on a large table in Mr. Moore's office is a map of the territory served by his company. It covers Los Angeles and Orange Counties. There are six districts in Los Angeles County and one in Orange. Each is clearly defined and the salesmen are thoroughly acquainted with the boundaries of their districts.

The number of salesmen assigned to a given district depends entirely upon the density of its prospective-customer population. Two salesmen take care of Orange County, while the remaining 18 are needed to cover the Los Angeles territory. Not only are the salesmen assigned districts but they are assigned customers as well.

It is the duty of the entire sales department to watch all papers and trade journals for leads, which, together with those derived from other sources, are immediately reported to the office. An architect may say that he is drawing up plans. A contractor may know of someone who plans to build. Consolidated Rock Products Co. wishes to know about it. But it is also the individual duty of each salesman to watch his district. If anything develops in the district assigned to him, he immediately reports it to the office and finds out why he has not been given a lead on it or whether it has been assigned to another salesman. This extra duty acts as a countercheck in the event the office has failed to catch something.

Once given the responsibility of an acccunt, the salesman will follow it. However, there are circumstances where coöperation between salesmen in different districts causes greater efficiency in the sales machinery of the company and works advantageously for the customer. For instance, should one of the salesmen in Los Angeles County sell a customer whose job is located in Orange County, one of the salesmen in the latter district would work with the former and service the job, thus giving closer personal touch.

As soon as the sales office knows of a job that is coming up an envelope, Form S-14 (Fig. 1), is taken out and a description of the job and all obtainable data as to quantities, etc., along with the date on which it is to be bid, are entered in the proper space on its face. The envelope is then filed under the bid date. Should specifications of the job appear in the newspapers or other periodicals, the clipping is pasted on the back of the envelope. Now that the lead is properly filed, 20 salesmen begin to work on it.

Should queries about this job come up for discussion, the salesmen may quote prices, etc. For this they use Form S-3 (Fig. 2). The original stays with the prospective bidder, while the first copy, a thin sheet, remains in the salesman's book and the second copy, a yellow sheet, goes to the main office to be filed in its proper envelope. There may be 20 yellow sheets showing the price quotations from each of the 20 salesmen. The number is variable, of course, depending upon the factors involved in the job.

At the date of letting, as soon as the sales office of Consolidated Rock Products Co. determines who is the low bidder, a lead number is assigned to the job and the contractor's name and address are entered in their proper places on the envelope, which is then transferred to the "live prospect" files

Date	Salesman	Lead No.	Zone	Tonnage			
				SAND	GRAVEL	CR. ROCK	BATCH
Contractor		Straight Loads f. o. b. Job					
Address		Stock Pile f. o. b. Job					
		Batch f. o. b. Skip Paving					
Job		Batch f. o. b. Skip Curb, Walk, Gutter					
		Call for					
		Car Load f. o. b.					
		Frt. Rate to					
Date Bid		Discount		SAND	GRAVEL	CRUSHED ROCK	BATCH
Sold By		Net f. o. b. Plant					
Remarks		Haul or Frt. to					
		Batching or Bunkerage					
		Haul Mi.					
		Discount					
Cement—Zone	Gross Price	Total					

Fig. 1—As soon as sales office hears of a job coming up an envelope like this, with description of job and date of bid, is filed under dating. Other facts are entered on the front as they become known.

where it is filed under the salesman's name. The salesman to whom the contractor is assigned gets Form S-1 (Fig. 3), which is called the "lead notice," along with all the data the office has been able to obtain about the job.

From then on the job is charged up directly to the salesman, whose duty it is to report directly to the office all calls made on the lead. These specific job reports are made daily on Form S-4 (Fig. 4).

If the contractor is sold, the purchase agreement or "signed order," as the sales force call it, is recorded on Form S-11 (Fig. 5). Both copies of this form are sent to the office where the credit is O.K.'d. It is then signed as approved by the sales manager or other officer in the Los Angeles office, in accordance with clause 7 of the agreement, and the carbon copy is returned to the customer. It now becomes an agreement between the contractor and the company.

When a "lead" becomes a "sold job," one of two things happens to the envelope. In the event that the salesman is unsuccessful the envelope goes into a file marked "Sold by Competitor," carrying the competitor's name, if obtainable. If the salesman is successful, the envelope goes into the undelivered tonnage section of the "Sold by Consolidated Rock Products Co." file, and the regular sales sheet or the price sheet goes through the accounting department.

It now becomes the duty of the salesman to see that his job is serviced. Every few weeks as his job progresses, he makes a report of such progress on Form S-8 (Fig. 6), sending it to the sales office. On this form he reports the amount of tonnage delivered and writes any other remarks of interest with regard to the job's progress.

With these reports on hand the office knows the correct volume of business booked ahead, but not until the salesman sends in his final report is the envelope moved from the undelivered tonnage file. When the job is completed the office cancels the price sheet, and the envelope goes into its permanent filing place in "Sold by Consolidated Rock Products Co."

The envelope, which is 5 in. by 8 in. and unflapped, always contains all specific forms and any information, such as tonnage or volume, that the sales office may have on the job. Through this method a fairly inclusive record is kept of every job in the territory served by the company.

The salesman gets credit only for signed orders. The credit be gets comes from the "sold tonnage"

FORM S-3

Quotation to _____ Date _____

Address _____

Job Description _____ Zone _____

Carloads F.O.B. Plants _____ Truck Loads F.O.B. _____ Bunker

F.O.B. Job _____

ALL PRICES ARE BASED ON A TON OF 2000 LBS. SCALE WEIGHTS AT OUR PLANTS OR BUNKERS

Bunker or Plant	Approx. Quantities in Tons			GRAVEL		CRUSHED ROCK				Batched per ton of 5, 6 Sack Batches	
		Plaster Sand	Concrete Sand			No	No.	No.		Pavement	Curb & Walk

TERMS AND CONDITIONS

All invoices for Rock and Sand are due and payable on 10th of the following month after date of invoice, subject to TWENTY CENTS per ton discount providing the entire account is paid in full. Otherwise account is Net.

This quotation is void unless accepted in the form of a purchase order or signed contract agreement of the Consolidated Rock Products Co. within ten days after the award date of contract, or if quotation is given after award of contract: 10 days from date of this quotation, providing such Purchase Order or Contract agreement is accepted by Sales Manager or duly authorized officer at the Main Office of the Consolidated Rock Products Co.; otherwise this quotation is not binding. In no case is this quotation binding for any period beyond 60 days from date.

Legal size loads for batching or to stock pile.

All above prices are for delivery of truck loads of not less than 5 tons each; deliveries made in less amounts will be charged on the basis of the actual weight of materials in the truck plus a flat charge of $2.00 per load. An extra charge of 10c per ton will be added to the above prices for Sunday and Holiday service.

Freight rates on carload shipments are given only as a convenience to customers and should be verified by Railroad Co.

CONSOLIDATED ROCK PRODUCTS CO.

By Salesman _____

Fig. 2—Should inquiries be made salesmen may quote prices. This form, S-3, is used and filed in the envelope shown in Fig. 1.

Date	Salesman	Pros. No.

JOB	TONNAGE		QUOTED DATE	ZONE NO.
	SAND	ROCK		

See								

Don't Forget to Sell Cement and Plastering Materials

NOTES

If job is sub-let give NAME, ADDRESS and PHONE NUMBER of Sub-contractor, and Type of work.

Sold by:

Reason:

Form S-1-Rev. 10M 6-31

Fig. 3—As soon as low bidder is known, the lead is given a number and the job, as a live prospect, is assigned a salesman who receives this Form S-1, along with information the company has concerning the job.

report, which is taken from the signed order. This naturally results in a conscientious effort to obtain the signed order being put forth by each salesman and no doubt plays a large part in the fact that 98 per cent. of the business of the company is done on signed orders.

The reason that the Consolidated Rock Products Co. is so insistent upon the signed order is not only because it wants to know the tonnage booked ahead for delivery (which is valuable information for the production department), but also because of the proved worth of the signed order from a collection standpoint. It eliminates to a certain degree disputes regarding the price agreement, because this is written.

A salesman may have 100 accounts to watch, and the office check to determine whether or not he is calling on the accounts is made through the daily report. For this he uses Form S-5 (Fig. 7) which, if properly filled out, immediately shows the office if the call is one of service or the result of a definite lead. The salesman's first knowledge of a job may be when he is told over the telephone to quote prices on a job on which a general contractor is figuring. Often the cases are reversed and the salesman will go to the general contractor to get him to bid on a job of which he has learned. All these calls, properly reported, keep the office informed of the daily activities of its salesmen.

The office does all it can to coöperate with its salesmen. Whenever a new service is inaugurated, such as building materials about two years ago and the ready-mixed-concrete this spring, instructions designed not only to acquaint the salesmen with, but to increase his selling efficiency of, the new service are prepared under the direction of General Sales Manager Moore. These are usually in compact form on the regulation punched paper that fits the salesman's book.

While the installation of ready-mixed-concrete service was going on its future salesmen were being prepared. The first broadside was a list typed in upper-case letters on letter-size paper under the heading:

Some Advantages of Ready-Mixed Concrete

1. Better Concrete Delivered to Suit Your Convenience.
2. More Volume of Concrete in Shorter Time.
3. Fewer Number of Batches Giving Better Concrete Control.
4. Elimination of Cement Storage and Sack-Return Loss.
5. No Waste of Materials.
6. No Stock-Piles to Contend with or to Be Shifted.
7. Elimination of Mixer and Equipment.
8. Longer Mixing Time, Giving Added Strength and Workability.
9. Perfect Water Control.
10. Fat Concrete, with All Large Aggregate Covered with Mortar, and Voids All Filled, Gives Better Footage, Eliminates Honeycombing.
11. Accurate, Uniform, Velvet-Like, with Perfect Consistency Makes Placing and Finishing of Our Ready-Mixed Concrete a Pleasure Instead of a Labor.

This was followed by three concise lists for the salesmen's books:

Types of Concrete Construction

1. Streets, Sidewalks.
2. Tunnels, Crossings.
3. Roads, Dams, Rails.
4. Electric Pole Bases.
5. Guard Rails, Fence Bases.
6. Tennis Courts, Pools.
7. Harbor Wharfs, Piers.
8. Curbs, Driveways.
9. Office Buildings.
10. New Floors, Slabs.

CONSOLIDATED ROCK PRODUCTS CO.

REPORT on _____ Date _____ 193__

Address _____ Lead No. _____

JOB _____ Zone No. _____

OUT	QUOTED DATE	NOT READY	WORK STARTS	FOLLOW UP DATE	LOOKS GOOD	TONNAGE SAND	TONNAGE ROCK

SOLD by ____ Rock ____ Sand ____ Cement ____

SOLD by—Bldg. Materials

Cement

READY MIXED CONCRETE

Cu. Yds. _____ Mix _____ Aggregate _____

Slump _____ Admixture _____ %

Remarks

TYPE OF PROSPECT

PAVING CONTRACTOR
Concrete _____ Macadam _____
S.W. & Curb _____ Asph. Type _____

BUILDING CONTRACTOR
Class A Bldg. _____ Apartment _____
Class B Bldg. _____ Dwelling _____
Class C Bldg. _____ Flatwork _____
Foundation _____

PLASTERING OR BRICK CONTRACTOR
Brick _____ Plaster _____

MISCELLANEOUS

Salesman _____

NOTE—If general contractor is sub-letting work—what part; get sub-contractor's name and address.
Reports must be forwarded daily to Manager of Sales Department

Fig. 4—It is the duty of the salesman to report all calls made on the lead to the office. For this he uses this Form S-4.

Form S-11 10M Sets 1-32

CONSOLIDATED ROCK PRODUCTS CO.

Los Angeles, Calif., 193

Lead No.

We propose to furnish you the following material for use in construction of

located at under your contemplated contract with

(Owner or General Contractor) deliveries to start not later than 193

no deliveries to be required of us after , 193 at prices and subject to conditions as follows:

All prices made on a ton basis of 2000 lbs. scale weights at our Bunkers or Plants. F. O. B. Zone

Bunker or Plant	Approx. Quantities in Tons	Plaster Sand	Concrete Sand	Gravel		Crushed Rock No.	Crushed Rock No.	Crushed Rock No.		Batched per ton of 5, 6 Sack Batches Pavement	Batched per ton of 5, 6 Sack Batches Curb & Walk

TERMS AND CONDITIONS

1. All invoices for Rock and Sand are due and payable on the TENTH day of the following month after date of invoice, subject to TWENTY cents per ton discount providing the entire account is paid in full. Otherwise account is Net.
2. Above prices, when stated f. o. b. Job, are for truck deliveries in full load lots. If, for any reason the Seller is required, or it becomes necessary for it, to make deliveries in less than five-ton loads, the purchaser will be charged on the basis of the actual weight of the materials in the truck plus a flat charge of $2.00 per load. For Sunday and holiday service, a charge of 10 cents per ton will be added to these prices.
3. Claims of error must be made immediately upon receipt of material so that same may be investigated promptly; (otherwise, no such claims will be allowed)
4. The above mentioned quantities are the full amounts estimated to be required for the job, but it is understood that this proposal is for the total quantity of like material actually required or used in the job whether more or less than the estimate, whether used by the purchaser hereof or any Sub-Contractor under the signer's contract.
5. Shipping instructions must be given by the Purchaser a reasonable time before shipments are to be made. The Seller will not be responsible for delays in manufacturing, shipping or delivering materials caused by Strikes, Accidents, Fires, Breakdowns, Impassable Roads, Failure of Machinery, Car Shortage or Congestion, Labor Scarcity, Labor Agitation, Acts of God, or any other cause beyond its control. "Any and all demurrage, storage and/or other terminal charges shall be borne and paid by the Purchaser."
6. The Seller reserves the right to require payment in advance or other security for deliveries under this proposal, whenever the financial responsibility of the Purchaser becomes impaired or unsatisfactory to the Seller.
7. This proposal is made subject to the approval of the Seller by its Sales Manager or other officer at its Los Angeles Office and shall not be binding upon the Seller until so approved; but when accepted by the Purchaser and so approved by the Seller, this proposal shall constitute a complete contract between the parties, and no representation or agreement not appearing herein shall have any force or effect whatever.

Respectfully submitted, CONSOLIDATED ROCK PRODUCTS CO.

Credit O. K. By

193

The foregoing proposal is hereby accepted and the undersigned agrees to purchase all the material referred to therein at the prices and on the terms therein stated.

APPROVED: CONSOLIDATED ROCK PRODUCTS CO. ACCEPTED

By CONTR'S LICENSE NO. BUYER

Fig. 5—When the job is sold, a "signed order" or purchase agreement is entered into on Form S-11.

11. Reservoirs, Walls.
12. Engine and Motor Bases.
13. Theaters, Churches.
14. Elevator-Pit Bases.
15. Electrolier Bases.
16. Retaining Walls.
17. Gasoline Service Stations.
18. Utility Companies.
19. Industrial Plants.
20. Dairy Products Plants.

The above are all fine prospects for Ready-Mixed Concrete.

The second list read:

Advantages of Ready-Mixed Concrete

1. Longer Mixing Time (Added Strength).
2. Fewer Number of Batches (Re Small Mixer) (Uniformity).
3. Concrete More Uniform (All Material Ribboned).
4. Better Water Control (Tank Calibrated in Gallons and Pounds).
5. All Aggregates Weighed (More Accurate Proportions).
6. Better Grading (More Sizes and Less Segregation).
7. More Accurate Cement Measure (More Uniform).
8. Consolidated Rock Products (Guaranteed Measure).
9. Laboratory Accuracy of Mix (Better Concrete).
10. Delivered in Commercial Quantities (From 1- to 4-cu. yd. units).

The final instructive list showed the:

Saving to the Contractor

1. Construction of Cement House Saved.
2. Loss of Sack Return Plus Waste Saved.
3. Stock-piles Eliminated.
4. Waste of Material Eliminated.
5. Lanterns Lost on Stock-piles Eliminated.
6. Moving Equipment to and from Job Eliminated.
7. Rental of Mixer Saved.
8. No Delay of Mixer Breaking Down.
9. Purchase Price of New Mixer Saved Plus Depreciation.
10. Water Bill, Hose and Connections Saved.
11. Concrete at Any Hour, Rain or Shine.
12. Deliveries as Small as One Cubic Yard.
13. Mixer Man on Job Eliminated.

FORM S-8 5M 1-31

JOB PROGRESS REPORT

Salesman

CONTRACTOR

Job Address

Tonnage On Order Date Sold

Fig. 6—As the job progresses reports on that progress are made from time to time by the salesman whose particular charge it is. For this he uses Form S-8.

14. Cement-Bag Men Eliminated.
15. Stock-pile Men Eliminated.
16. Fewer Men Necessary to Spread Concrete.

Mr. Moore, who heads the sales force, has great faith in photographs as aids to talking points. This results in another form of coöperation between the salesmen and the office. Many pictures are taken of the various jobs serviced to show to advantage points already outlined in the above lists. Each salesman gets copies of all photographs taken of jobs in his districts and these he uses advantageously in his approach to a prospect for the company's materials.

S-5 REVISED SM 8EPT. 1-32

CONSOLIDATED ROCK PRODUCTS CO.

SALESMAN'S DAILY REPORT

DATE_____ 19____ SALESMAN_____

SPEEDOMETER READING	MILEAGE	GALS. GAS	QTS. OIL
A. M.			
P. M.			

TIME	NAME	TYPE OF JOB	LOCATION	LEAD NO.

Attach Form S-4 showing detail of all calls made and forward daily to Manager of Sales.

Fig. 7—For his daily reports of calls made upon the customers assigned him, a salesman uses Form S-5. This gives the office an excellent check upon the salesman's work.

The system of selling outlined herein serves Consolidated Rock Products Co. in yet another and very important way. Ten years of eliminating difficulties by Mr. Moore has resulted in the two permanent files, "Sold by Consolidated Rock Products Co." and "Sold by Competitor," that hold a description of practically every job in the territory served by this company.

From these permanent files the office, from time to time over regular intervals, accumulates tonnage and from the resultant figures determines whether or not it is holding the position it should have in the market.

Saxet (From page 20)

and dredges were designed by W. H. K. Bennett. The dredge pumps and cutting ladders are "Diamonds," made by the Pettibone-Mulliken Co.

Near the plant is a wooden building which houses the plant office and a fully-equipped laboratory, where visiting inspectors make their tests. A completely-equipped machine shop is used for practically all repair work, including the rewelding of wornout dredge-pump shells. Because of the extremely abrasive material handled even the manganese-steel pump shells wear out rapidly. Each rewelded shell will last about 75 per cent. as long as a new one and can be rewelded twice before it is discarded. In this manner a substantial saving is effected.

The plant was originally owned by the Saxet Co., which operates all sorts of utilities and manufacturing industries. This company was acquired by the Moody-Seagraves interests, which changed the name of the company to the Republic Gas Corp. The gravel plant, however, retained the name of the Saxet Sand & Gravel Co. The main offices of this company are in the Niels Esperson Bldg., Houston, Tex., and its officers are: Wm. F. Morgan, president; Henry M. Brown, vice-president and treasurer; and T. M. Norsworthy, general manager. H. T. Brewster is plant manager and H. M. Crain is plant superintendent.

Ready-Mixed Concrete (From page 23)

plant. The aggregates are heated by means of steam coils around the bins and the water by means of steam jets in the 500-gal. water-tank at the foot of the plant. The concrete goes into the trucks at a temperature of from 68 to 70 deg. and loses less than 2 deg. of this heat during a haul of average length, even when the temperature of the air is as low as 10 deg. above zero. F. The company uses Incor cement and Haydite only for large jobs and uses admixtures in the concrete only when specified.

The location of the plant at 1100 Birdsall Parkway Blvd. is almost ideal. It is served by sidetracks from the Indianapolis Union Ry. belt line and by the C. C. C. & St. L. Ry. The plant is only a 15-min. haul from the heart of the city and its location near the center of industrial expansion is evident from the fact that the average haul is about 4 mi. Concrete has been successfully delivered, however, as far as 20 mi. from the plant. A large-scale map in the plant office is used for figuring hauling costs to various parts of the city.

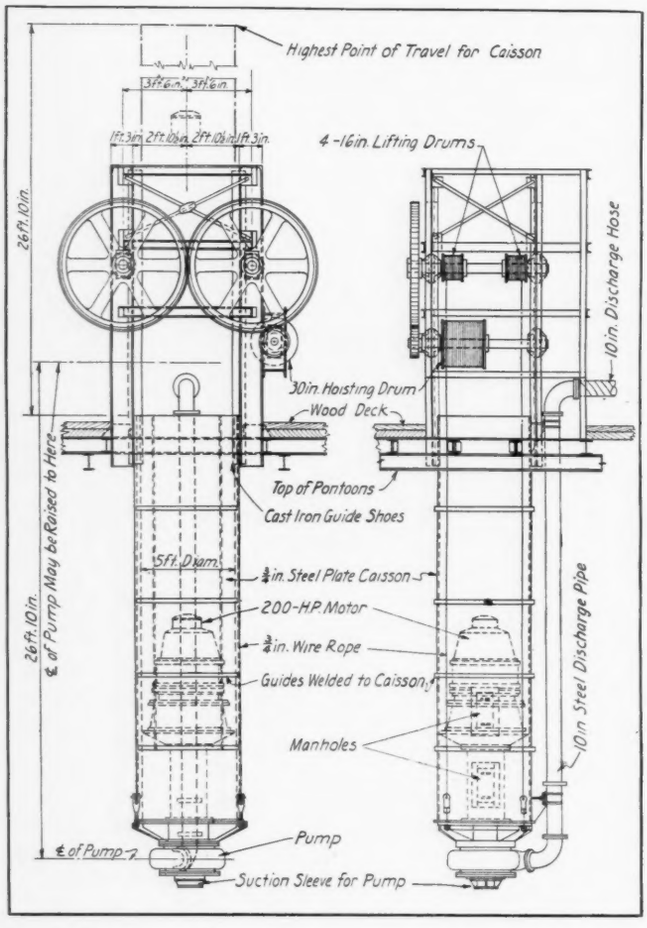
The Ready Mixed Concrete Corp. is owned by the Standard Paving Co., which has been in the asphalt paving business since 1919. The two companies have the same officers. On the same property with the concrete plant the company has an asphalt-mixing plant and a storage-shed which houses the trucks, rollers and other equipment used for this work. There is also a machine-shop in which all repair work for both plants is done.

Project Plan to Increase Percentage of Solids in Dredged Material

A UNIQUE dredging installation is to be placed in service shortly by a large sand-and-gravel producer in the middle west, by which the percentage of solids in the material being pumped is to be increased materially.

The possibilities of this installation appear to be of great importance to dredging operators and, if as successful as present tests have indicated they will be, may point the way to a change in future operations in subaqueous mining.

Normal dredging operations produce a concentration of material by volume averaging about 10 per cent. Under certain conditions this may be higher, but ordinarily at the risk of unstable suction in the pump. As all operators appreciate, the suction pipe leading to the inlet of the pump is normally lowered to the material level, and the velocity of the water entering this pipe carries with it a certain proportion of sand and gravel. The higher the proportion, the more efficient the operation becomes. Water is forced into the suction line through the sand and gravel by a loss in pressure. In general, it may be said that the greater the concentration of the material carried with the water, the greater the loss in pressure to force it into the suction pipe.



Sketch showing arrangement of the pump and motor which are inclosed in a caisson for operation below water-level and near the source of supply.

Manifestly, as all this loss in pressure takes place on the suction side of the pump, the amount is definitely limited to the possible vacuum obtainable. From a practical standpoint, a vacuum of about 25 ft. of water is all that is obtainable. From this must ordinarily be subtracted about 5 ft. of water representing the elevation of the center line of the centrifugal pump above the water-line. There is a further loss representing the friction in dragging the water and the material up the length of the suction line, which in the average installation might represent 3 ft. of water. This leaves a net available pressure drop for forcing sand and gravel into the suction line equivalent to 17 ft. of water, which results in average concentrations of 10 per cent. by volume.

With this thought in mind a prominent maker of dredging pumps has developed a pump which will operate vertically beneath the water-line to any reasonable depth. It is thus apparent that the pressure drop available for forcing water through the sand and gravel into the inlet of the suction line is equal to 25 ft. (possible vacuum of the pump) plus a hydrostatic head, the equivalent of the amount the center-line of the pump is submerged below the water-level. Note that there is no subtraction from the 25 ft. available vacuum to raise the water from the water-level up to the center-line of the pump, and there is much less loss because of friction in the suction line, since the suction line starts at 20 ft. below water.

An example will illustrate the point. Assume that the vertical pump is submerged 20 ft. beneath the water-level and the suction line dropped on the sand. Then the available pressure differential for forcing material into the suction of the pump will be equal to 20 ft. of water (the depth it is submerged) plus 25 ft. of suction (the amount of vacuum that it can produce),—or a total of 45 ft.

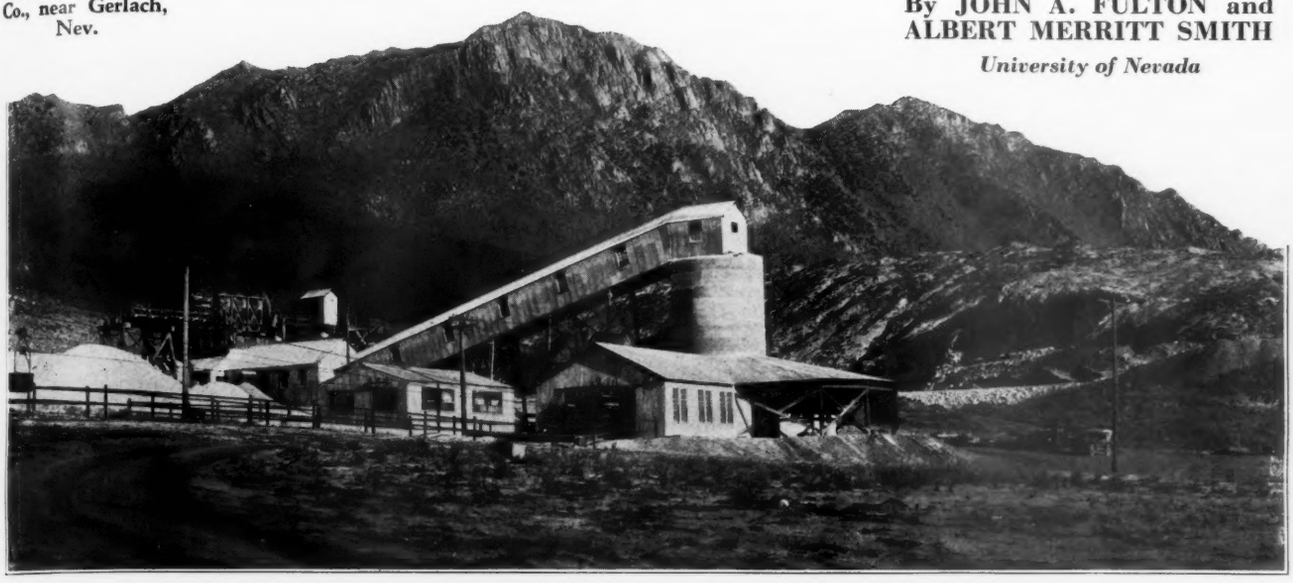
There is available 45 ft. for forcing material into the suction of the pump instead of 17 ft., as is the case in the average installation as ordinarily made. It is believed that the possible concentrations, therefore, will be more than doubled. The manifest advantages of this arrangement are as follows:

1. Double capacity of a given pipe-line and dredge equipment.
2. No additional wear on the pump or pipe line because of the additional capacity.
3. About 60 per cent. of the power normally required per ton of material moved is used.
4. It is substantially impossible to "slug the pump off" because of cave-in.
5. A much simplified arrangement as to hoisting mechanism.

This equipment is replacing the conventional type of horizontal dredge pump. It is expected to at least double the output of the plant and, because of the efficiency of the pump plus the advantages of this new method of installation, the actual power requirements will be reduced.

Nonmetallic Minerals in Nevada

By JOHN A. FULTON and ALBERT MERRITT SMITH
University of Nevada



(Below)—Part of the plant and quarry of Pacific Portland Cement Co., near Gerlach, Nev.

NEVADA comprises about three-fourths of the Great Basin and is an intermountain region with interior drainage. The state is devoid of natural resources, such as great forests, great coal fields, oil fields or adequate water-power necessary for the development of large industrial centers, with the single exception of Colorado River along its southernmost boundary. The state abounds in mineral occurrences, both metal and nonmetal in character, but on account of the great distances within the state and to markets without the state, the exploitation of the mineral occurrences, especially the nonmetals, has been greatly handicapped.

The cheap power from Hoover Dam on Colorado River will be the creative factor for the development of a great electro-chemical and electro-metallurgical industry in the area contiguous to it. As a result of this development the nonmetal occurrences in the southern half of the state will assume an economic importance never before even contemplated.

Hoover Dam power will be available in about six years and possibly less. The cost of firm power at the switchboard will be about $14 per hp.-yr. and secondary power, if and when available, about $5 per hp.-yr. The state of Nevada has been allocated 117,000 firm hp. at switchboard price, Arizona has been allocated a like amount, the remainder or 416,000 firm hp. is allocated to southern California interests. On account of the increasingly-low cost of generating power by steam in southern California, the opinion is held by many competent persons that Hoover Dam power will not be taken to southern California, provided it can be utilized near its source. If this opinion is correct, it means much more power will be available for use in the dam area than has been allocated to Nevada, which means further that, on account of the very low cost for power, a mild climate throughout the year, a satisfactory labor market, an almost unlimited factory site area at low prices, and an unparalleled wealth of nonmetal occurrences, a vast electro-chemical industry should be developed in the area contiguous to the dam.

The following nonmetallic minerals are found in Nevada:

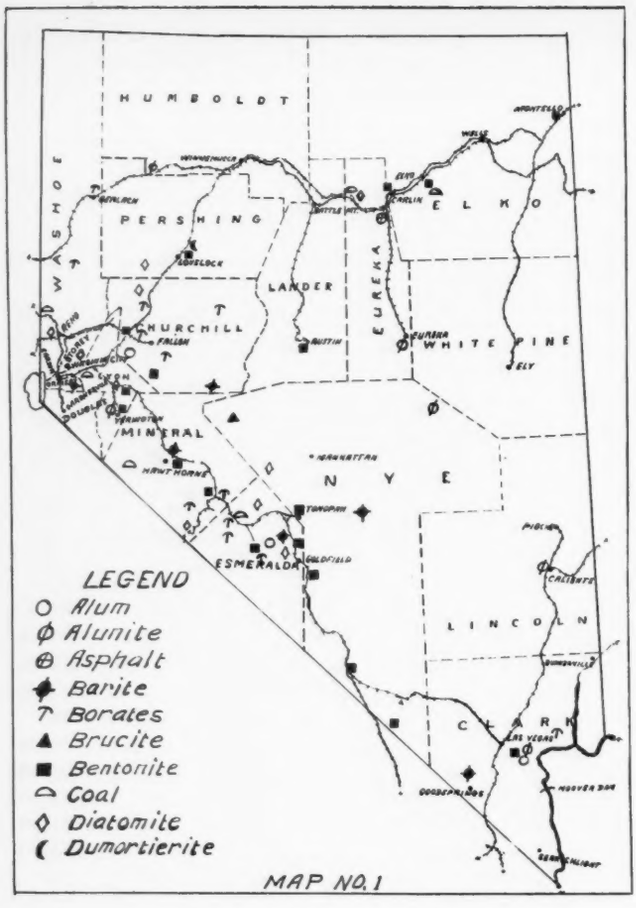
Alum, alunite, asphalt, barite, bentonite, borates, brucite, diatomite, dumortierite, feldspar, fluorspar, graphite, gypsum, iceland spar, limestone, magnesite, marble, marl, nitrates, oil shale, salt, silica, slate, soda, sodium sulphate, stone, sand and gravel, sulphur, and volcanic ash.

Alum.—Alum is found in Las Vegas District, Clark County; Alum District, Esmeralda County; and at Lahontan Reservoir, Churchill County. During 1921 deposits of magnesia alum were mined in low hills on the south shore of Lahontan Reservoir, 16 mi. southwest of Fallon. These deposits were examined by Hewett [1] who reported 30,000 tons available from the surface, containing 10 to 15 per cent. of soluble magnesia alum.

In Alum District, Esmeralda County, 35 mi. west of Tonopah, there is a deposit of mixed potash-alum and sulphur estimated to contain more than 1,000,000 tons.[2] During 1921 Western Chemical, Inc., of Tonopah erected at the deposit a treatment plant with capacity to produce 10 tons of c.p. potash alum and 10 tons of 85-per cent. sulphur concentrate per day. The plant operated intermittently, but is now idle.

Alunite.—Occurrences of alunite have been observed and samples received from the following districts: Clark County (Las Vegas and Railroad Pass Districts), Eureka County (Eureka District), Humboldt County (Sulphur District), Lincoln

[1] Hewett (D. F.). *Deposits of Magnesia Alum near Fallon, Nevada.* U. S. Geol. Survey Bull. 750, pp. 79-86, 1923-1924.
[2] Duncan (Lindsay). *Recovery of Potash Alum and Sulphur at Tonopah.* Chemical and Metallurgical Engineering, vol. XXIV, pp. 529-530, 1921.

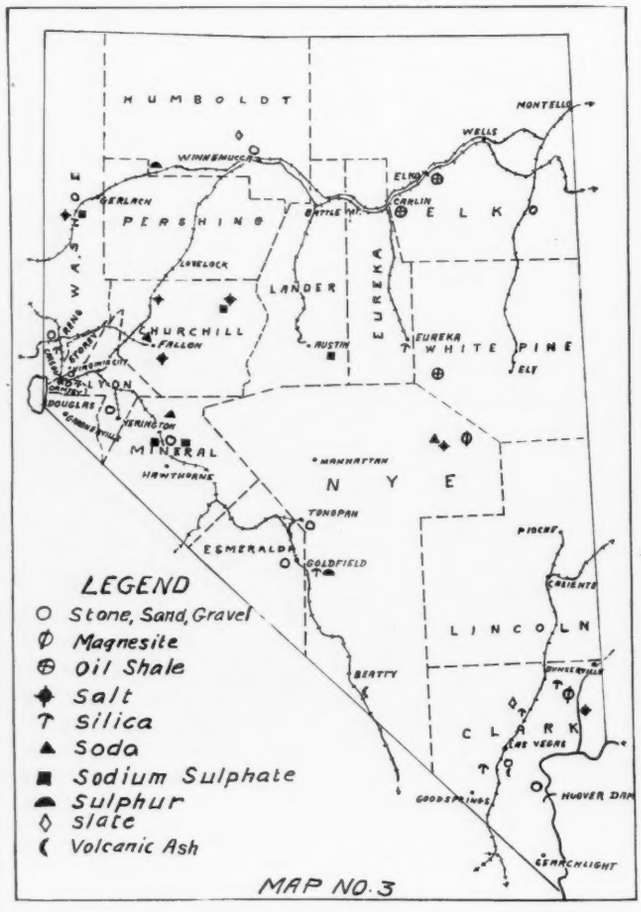


A series of maps showing the locations of the nonmetallic-mineral deposits of Nevada.

County (Caliente District), Lyon County (Yerington District), and Nye County in what is known as Burrel Hot Springs District.

The value of ground raw alunite as a fertilizer has not been definitely established, but claims are made in its favor. Experiments have shown that calcined potash alunite is a valuable fertilizer.[3]

Asphalt. — Asphaltite occurs in the Pinon Range in Eureka County, 15 mi. south of Palisade, 4 mi. east of Maples Ranch on the Eureka Nevada railroad, according to Anderson.[4] The mineral is of the variety known as impsonite, and would be commercially classed as graphamite. It is found in lenses, stringers and sheets along a fracture zone 3 ft. wide in sandstone and shale. Although it has been but slightly prospected the distribution is believed extensive. Outcrops are reported ½ mi. east, 3 mi. north and 7 mi. south of one point of discovery. Deposits of similar material are being mined with much profit in the neighbor state of Utah.



Barite.—Barite occurs in many districts, often as a gangue mineral in metal-bearing veins, and in other deposits sufficiently pure to be of value. Lincoln[5] describes various prospects.

[3] Ladoo (B. L.). *Nonmetallic Minerals.* McGraw-Hill Book Co., Inc., New York, p. 26, 1925.

[4] Anderson (R.). *An Occurrence of Asphaltite in Northeastern Nevada.* U. S. Geol. Survey Bull. 380, pp. 283-285, 1909.

[5] Lincoln (F. C.). *Mining Districts and Mineral Resources of Nevada.* Mackay School of Mines, University of Nevada, 1923.

In the Eagleville District of Churchill County a barite vein 3 to 4 ft. wide has been exposed for a length of more than 1,100 ft. and developed to a depth of 80 ft. During 1930 and 1931 the American Development Co., owners, shipped about 40 car-loads to its grinding plant in Berkeley, Cal. A deposit of barite has recently been opened at Ellendale, in Nye County, 37 mi. east of Tonopah.

Bentonite.—Bentonite is used in drilling oil-wells on the Pacific Coast, as it will seal large crevices in the rock formations which allow ordinary drilling mud to flow out and be lost. During 1931 interesting new work was done with bentonite as a sealing compound to stop leaks and prevent seepage in ditches and reservoirs. The results are reported to be satisfactory. Davis and Vacher [6] have described the uses of bentonite, and the properties that determine suitability for various uses. This important work was done at the Reno Station of the U. S. Bureau of Mines, in coöperation with the Mackay School of Mines, University of Nevada, Reno.

Commercial bentonite is being produced in the following localities: Clark County (Richfield Oil Co., 2,960 tons in 1929), Esmeralda County (Klondyke and Silver Peak Districts), Lyon County (Ft. Churchill and Wabuska Districts), Mineral County (at Sodaville, near Mina), and Nye County (at Ash Meadows).

A deposit located 4 mi. west of Mina in Mineral County was optioned to the General Petroleum Co. of California in 1929 and shipments of 25 to 50 tons per day were made to Los Angeles over the Owens Valley branch of the Southern Pacific R. R.

The Coen Companies, Inc., are mining a deposit at Ash Meadows, Nye County, 12 mi. northeast of Death Valley Junction on the Tonopah & Tidewater R. R. The clay company has built a 3-mi. narrow-gage railway from the quarries to the main line. It reported a production of 5,274 tons during the first half of 1930, valued at $85,735, mined for the Union Oil Co. of California.

The Florida Bentonite Mine, in southern Nye County, was operated by the Union Oil Co. of California during 1929 and produced 7,057 tons, having a gross value of $103,032.20. The Richfield Oil Co. operated a mine in Clark County and produced 2,960 tons, gross value $48,100.

A large deposit resembling commercial Wyoming bentonite occurs near Silver Peak in Esmeralda County. It is said to be 15 ft. thick, quite pure, and to cover an area of several square miles. Samples were examined and tested by Davis [6] during 1928.

An important deposit is located near Sodaville, 4 mi. south of Mina, owned by Cooper Shapely Bentonite Co., of Bishop, Cal. This company states that in 1929 it shipped 9,000 tons to grinding plants in Los Angeles, where it was ground and packed in 100-lb. bags and sold as Aqua Gel, Rotary Gel, and other trade names, depending upon the grade and fineness of mesh.

Bleaching clays for oil-refinery uses were quarried in large quantities from a deposit 10 mi. northeast of Death Valley Junction in the Ash Meadows District of Nye County by the General Clay Co. of Los Angeles. The clay at this point is described by Arciniega [7] as occurring in lake beds of Tertiary origin, with a nonplastic aluminum-silicate clay overlying nonplastic magnesium-silicate clay, the latter being much better for oil-refining purposes. The beds are covered by 1 to 5 ft. of overburden which is stripped before quarrying the clay.

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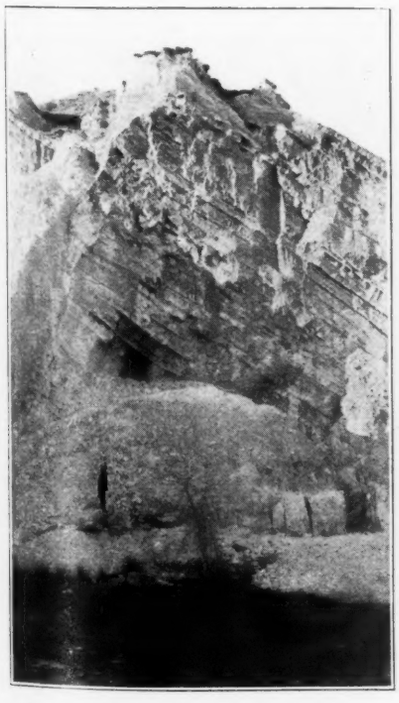
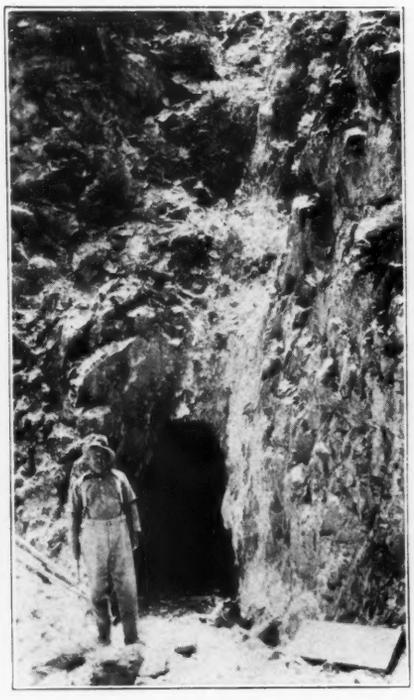
[6] Davis (C. W.) and Vacher (H. C.). *Bentonite, Its Properties, Mining, Preparation and Utilization.* U. S. Bureau of Mines Technical Paper 438, p. 51, 1928.

[7] Arciniega (V. M.). *Refinery Clays Mined in Nevada.* Engineering and Mining Journal-Press, vol. 121, p. 408, 1926.

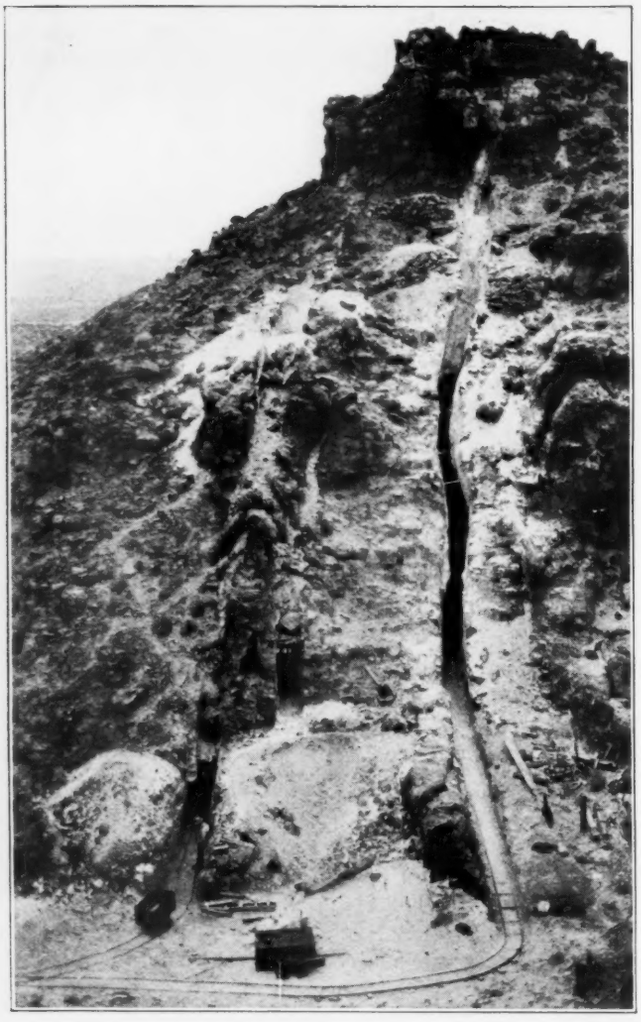


Tunnel in St. Thomas magnesite deposit, Clark County.



Fluorite vein at Mt. Montgomery mine, Mineral County.

Scraper in Sparton silica-sand deposit near Overton.



Alunite veins near Sulphur, Humboldt County.

The Standard Oil Co. of California has also mined much bentonite in the Ash Meadows District from a bedded deposit of recent geological age. The bed is from 4 to 10 ft. thick, and outcrops at the base of a terrace. It is overlaid by 50 to 100 ft. of sandstone, clay and marl, and is mined by underground methods.[8]

Borates.—Borate deposits in many districts have been described and a lengthy bibliography on Nevada borates is listed by Lincoln.[9] For many years Nevada led the United States in the production of borax, all which was obtained from so-called marsh or dry-lake-bed deposits. California superseded Nevada in production after discoveries of colemanite (calcium borate) in Death Valley in 1882.

Dixie Marsh and Sand Springs Marsh in Churchill County, Teels Marsh and Rhodes Marsh in Mineral County, and Columbus Marsh in Esmeralda County have in the past contributed large tonnages of borax produced principally from ulexite (hydrous sodium-calcium borate). From 1874 to 1883 the leading producer was F. M. Smith ("Borax" Smith), with the Pacific Coast Borax Co. second. After 1883 Smith extended his operations into California.

[8] Melhase (John). *Mining Bentonite in California.* Engineering and Mining Journal Press, vol. 121, pp. 837-842, 1926.
[9] *Op. cit.*, pp. 261-262.

Diatomite.—Large deposits of diatomite occur in Churchill, Elko, Esmeralda, Lyon, Nye, Mineral, Pershing, Storey and Washoe Counties, in each of which it has been mined or quarried.

Nevada deposits of diatomite are of the fresh-water variety. Fresh-water diatomite is composed of smaller silica cells than the salt-water diatomite of the Pacific Coast and has somewhat different physical properties. The Nevada beds, often lenticular in form, are found in the Siebert formation of the Tertiary. Several deposits are exceedingly large and are composed of excellent, clean, white diatomite. The present production can easily be greatly increased.

At Vivian, 4 mi. east of Carlin, Elko County, a deposit is being worked by the Triolite Co. Diatomite is mined, air-dried, and trucked to a mill for grinding, grading and packing for market. About 2,000 tons is sold annually, three-fourths of which is used for insulation purposes.

In the Chalk Hills District of Storey County, 9 mi. northeast of Virginia City, a deposit has been mined by the Electro Silicon Co. for many years. About 100 tons is annually shipped to New York, where it is pulverized and marketed for silver polish.

Dumortierite.—There is a valuable and interesting occurrence of this unusual mineral near Oreana, Pershing County, the only place in the world where it is produced on a commercial scale. Dumortierite is a basic aluminum silicate containing boron. It is of great value in the manufacture of several classes of refractories and ceramic products, including porcelain spark-plug cores, which is the most important.[10]

The deposit is owned by the Champion Porcelain Co. of Detroit, Mich., which has mined and shipped over 2,500 tons of the mineral since acquiring the property in 1925.

Feldspar.—West of Searchlight, in Clark County, a deposit of feldspar occurs as a pegmatite vein in granite. A. B. Robins of Goodsprings has made some shipments to Los Angeles via Nipton, which station is on the Southern Pacific R. R. 6 mi. west of the mine.

About 18 mi. north of Reno, in Washoe County, there is an occurrence of very pure potash feldspar (orthoclase) which promises to be of importance. A number of car-loads were shipped to San Francisco during 1931. The feldspar occurs in a pegmatite dyke, 4 to 15 ft. wide and about 3,500 ft. long. The three best exposures have been mined.

Fluorspar.—Nevada has several large deposits and numerous undeveloped prospects of this important mineral. The operating fluorite mines are the most western of all in the United States, and are destined largely to supply a growing demand on the Pacific Coast.

In 1929 there was shipped to Pacific Coast steel plants 757 short tons of run-of-mine fluorspar, principally from the Daisy Mine. In 1930 the ship-

[10] Riddle (F. H.). *Mining and Treatment of Sillimanite Group of Minerals and Their Use in Ceramic Products.* Technical Publication No. 460, American Institute of Mining and Metallurgical Engineers, pp. 23, 1932.

ments increased to 1,400 tons. During 1931 the demand diminished and only 400 tons was shipped prior to June, 1931.

The Continental Fluorspar Co., located at Beatty, Nye County, has productive mines, the most important of which is the Daisy. The Daisy Mine, located 4½ mi. southeast of Beatty, has been increasingly productive for 10 yr., and operated continuously during 1929, 1930 and 1931.

The Baxter Fluorite Mine is located on the line between Churchill and Mineral Counties, 5 mi. west of Broken Hills. Fluorite outcrops for a distance of more than 2,000 ft. The crystalline fluorite content of the vein is from 10 in. to 4 ft. in width. A car-load shipped in 1928 is said to have analyzed 99 per cent. About 600 tons was shipped to the Pacific Coast in 1929, lesser amounts in 1930 and 1931.

In Mineral County, 3 mi. south of Mt. Montgomery station on the Owens Valley branch of the Southern Pacific Railroad, there is a large fluorite deposit owned by Sol Summerfield of Mina.

Graphite.—Graphite occurs in three districts. Nevada was one of three states to record production in 1928, the other two being Rhode Island and Michigan.

The Pacific Graphite Works of Carson City, Nev., and Oakland, Cal., has produced a quantity of amorphous graphite annually for many years from the Chedic Mine, 5 mi. southwest of Carson City. The graphite occurs in shale of Triassic age, according to Lincoln.[11] The crude graphite is shipped to Oakland, Cal., where it is ground and bolted and sold principally for a paint pigment and foundry facings.

Gypsum.—Nevada ranks seventh among the gypsum-producing states of the nation. Mineral Resources for 1928 states that Nevada mines a total of 278,405 tons of crude gypsum, of which 52,878 tons was sold without calcining to cement plants, and 196,348 tons was sold calcined. In 1929 the state produced a total of 225,514 tons, having a total value of $1,290,854.

There are also a number of inoperative deposits, some dormant, others undeveloped. Some of these are of great size, and could readily be made productive on demand.

The following gypsum companies are operating in Nevada at present:

About 20 mi. west of Arden and adjoining the west side of the Blue Diamond property is the Matteucci gypsum deposit. It is an extension of the Blue Diamond beds, and covers an area of more than 1 sq. mi. Outcrops of two beds, each about 12 ft. thick, are exposed by numerous cuts and trenches show the gypsum to be comparatively free from anhydrite, white, and of excellent grade.

Blue Diamond Co., Cons., Los Angeles, Cal. Mine near Arden, Clark County, Nev. Plant at Los Angeles. Plaster and plaster products.

Pacific Portland Cement Co., Cons., San Francisco, Cal. Mine and plant near Gerlach, Washoe County, Nev. Plaster and plaster products.

Standard Gypsum Co., San Francisco, Cal. Mine and plant at Ludwig, Lyon County, Nev. Plaster and plaster products.

Regan Bros., Mason, Nev. Mine 12 mi. east of Yerington. Crude gypsum.

Iceland Spar.—Iceland spar (perfectly clear calcite crystals) suitable for optical-manufacturing purposes occurs in three places in Washoe County. Some crystals from northern Washoe County have been marketed during the last 10 yr., although only a very small amount of mining has been done. It is stated that the Iceland spar found north of Pyramid Lake is of the highest quality.

Limestone.—Limestone is abundant and widely distributed throughout the state. In eastern Nevada are vast beds extending north and south for hundreds of miles. They have been tilted and broken into long mountain ranges, and in many areas have been intruded by igneous rocks. Other limestone districts are partly covered by lava flows. In the eastern part of the state the limestone beds are of Paleozoic age, and range from the Cambrian to the Carboniferous. Strata of limestone and dolomite are often interbedded, particularly in southern Nevada.

Limestone suitable for building and also for the manufacture of quicklime is common in many counties. Quarries for both building stone and lime rock for calcining have been operated at Carson

Outcrop of green slate north of Las Vegas, Clark County.

[11] *Op. cit.*, p. 200.

City, Ormsby County; at Dayton and Wabuska in Lyon County; at Jean and Sloan, Clark County.

More than 50,000 tons of lime rock per year is shipped from Sloan to southern California for use in sugar refineries alone. Sloan is on the Union Pacific R. R., a direct line between Los Angeles and Salt Lake City. In addition to being pure, lime rock for use in sugar refining must possess certain special physical properties that are lacking in a great majority of deposits. It must have a tough cryptocrystalline structure, and retain strength and coherence during and after calcining. No other quarry on the Pacific Coast has yet been developed having as suitable sugar lime rock as Sloan.

The Sloan quarry has an annual production of about 100,000 tons of limestone, 15,000 tons of high-calcium hydrated lime, and 75,000 tons of burned lime. An overlying bed supplies several thousand tons of dolomite, which is quarried and sold to steel plants for open-hearth furnace lining. During the last four years a large quantity of dolomite has also been burned and hydrated for plaster-finishing hydrate.

From Jean, also on the railroad and 12 mi. south of Sloan, about 60,000 tons of limestone per year is shipped to Los Angeles markets. The ease in quarrying, high purity, large deposits, low cost of transportation, combine to make Clark County a very important producer of limestone products.

Magnesite.—In addition to the magnesite associated with brucite near Luning, there are several other very extensive occurrences of magnesite. One borders the Muddy River Valley, a few miles north of St. Thomas in Clark County, a great bedded deposit, 150 to 300 ft. thick and 3 mi. long. Another deposit is in Currant District, Nye County, 41 mi. southwest of Ely, near the Ely to Tonopah highway. An occurrence is listed near Ash Meadows, Nye County. Thirteen miles east of St. Thomas and 3½ mi. east of Virgin River is a deposit of good

Clay pit near Ft. Churchill Station, Lyon County.

magnesite 3 to 11 ft. thick and 5,000 ft. long. The Nevada Magnesite Co. owns a portion of the massive deposit north of St. Thomas.

A very large undeveloped magnesite deposit is located in Nye County, in the White Pine Mountains of Currant District. It is a bedded deposit and underlain by slate, conglomerate and tuff, and overlain by a flow of basaltic lava. The strata containing the magnesite extend for miles along several mountain ridges. The beds are not entirely composed of magnesite, yet contain many places not contaminated with calcium carbonate and silica.

Marble.—Marbles are well represented but, owing to the cost of transportation and the difficulty of gaining entrance to established markets, only a few have been quarried. Marble has been quarried at Carrara in Nye County; in Lamiolle Valley, Elko County; and near Luning and Mine, Mineral County. Undeveloped marble beds are present in Elko, Pershing, White Pine, Lyon, and Washoe Counties.

The marbles of White Pine County are 4 mi. west of the Nevada-Utah boundary line, and 5 mi. southwest of Gandy, Utah. Darton [12] described the marble formation as being 150 ft. thick, dark bluish gray in color in general, with portions banded or mottled light gray and white. The long haul to the railroad has prevented development.

A deposit of white marble of unusual purity occurs near the south end of Pyramid Lake in Washoe County, 2 mi. north of Nixon. The deposit is in beds of Jurassic limestone of gray color which surround it on all sides. Analyses by the Nevada State Laboratory show 99.5 per cent. calcium carbonate, and only traces of magnesia, alumina, silica and iron.

Marl.—Marl, a pulverulent form of limestone, occurs in large quantity near the northwest shore of Pyramid Lake 8 mi. north of Sutcliff, in Washoe County. The material is known as chara marl, and was formed by the deposition of lime by algea during the Lahontan period of the Pleistocene age. Much of it lies in thick beds 150 ft. higher than the present lake level.

Extensive areas of weathered and powdered marl of the same origin are 8 mi. north of Pyramid Lake at Sutcliff. The substance is excavated, sacked and sold under the trade name of Carbolime, which is shipped to California for use as a soil conditioner.

Salt.—Great deposits of salt exist in the state. Some of them have been mined from time to time for more than 70 yr. During the last 20 yr. salt has been produced and sold from Sand Springs, White Plains, Leete, and Paran in Churchill County; from Silver Springs in Esmeralda County; from Buffalo Salt Works in Washoe County; and from Virgin River Valley in Clark County. Much of the salt was obtained by solar evaporation of brines. Other salt deposits occur at Dixie Salt Marsh in Churchill County; Railroad Valley in Nye County; and west of the Diamond Range in Eureka and Elko Counties.

Present operations are being conducted at only two deposits, one at Sand Springs Salt Flat, 25 mi. southeast of Fallon, where the plant of the Nevada Pure Salt Co. is located. This year the company has been considering the construction of a railroad to Fallon.

Rock salt is being shipped to Los Angeles by the Virgin River Salt Co. from Virgin River District

[12] Darton (N. H.). *Marble of White Pine County, Nevada, near Gandy, Utah.* U. S. Geol. Survey Bull. 340, pp. 377-380, 1908.

in Clark County. Thick salt beds are exposed at numerous places on both sides of Virgin River for a distance of 12 mi.

If a large deposit of salt can be obtained near Hoover Dam, it will be of much value to future electro-chemical industry there. Geological observations indicate that underground extensions of the massive Big Cliff deposit, 4 mi. south of St. Thomas, may be found by drilling the Tertiary clay beds west of the reservoir site.

Silica.—Silica, both as silica sand and as clear rock quartz, is widely distributed throughout the state, and a number of deposits have made commercial production. In the Cuprite District, Esmeralda County, are large deposits associated with alunite and sulphur. Quantities of silica were shipped from Cuprite during the period from 1914 to 1918 by the Super Silica Corp. and the American Tripolite Products. No production worthy of mention has been made in recent years.

At Steamboat Springs in Washoe County, 10 mi. south of Reno, Balfour, Guthrie & Co. mined and shipped a quantity of glass sand during 1931. The sand shipped contained an average of more than 99 per cent. silica, 0.6 per cent. aluminia and about 0.04 per cent. iron oxide. It was sent to glass works in San Francisco.

The Spartan Silica Co. has a mine and mill at Overton, in Clark County, where it makes an annual production of about 30,000 tons of washed silica sand which is shipped to Los Angeles.

Clark County contains a number of large deposits of silica sand destined to become valuable with the steadily increasing development of ceramic and refractory industries on the Pacific Coast. Two of these are located 7 and 11 mi., respectively, northwest of Crystal; another in the White Basin District about 12 mi. southeast of Crystal. A quantity has been shipped from the White Basin deposit, the owners of which have a crusher and warehouse at Crystal. Near Apex, 12 mi. north of Las Vegas, is an outcrop of hard white sandstone interbedded with limestone; and on the Union Pacific R. R., 30 mi. south of Las Vegas, is a large deposit of loosely consolidated sandstone from which a number of car-loads were shipped to glass companies in 1931.

Slate.—A dark blue roofing slate is found in the Blue Mountains in Humboldt County, 21 mi. northwest of Winnemucca. A report by Dale [13] is favorable, but states tests should be made by an experienced slate workman. Long distance to the railroad and greater distance to building centers have prevented its exploitation.

An occurrence of green slate that was attracting attention last year is located in Clark County, 55 mi. north of Las Vegas. The deposit is about 300 ft. wide, 3 mi. long, and dips at an angle of 75 deg. It is of a permanent olive-green color and weathers well. The green outcrop may be observed from a long distance.

Soda.—Two occurrences of sodium carbonate that have been worked extensively in past years are described by Lincoln, and are located at Soda Lakes in Churchill County and at Double Springs Marsh in Mineral County. At the Soda Lakes, 6 mi. northwest of Fallon, 500 tons of soda was produced annually from 1868 to 1885. Operations were discontinued there in 1890.

During 1913 the Railroad Valley Co. of Tonopah drilled a total of 10,000 ft. in seven wells in Railroad Valley (Butterfield Marsh District) in Nye County. The drilling explorations were an unsuccessful search for potash in commercial quantity.

White Star gypsum quarry in Clark County.

Sodium Sulphate.—Saline lakes and playas containing sodium sulphate have been recorded as follows: West of Humboldt Sink and from Buena Vista Valley in Pershing County; Smoke Creek Desert in Washoe County; Big Smoky Valley in Esmeralda County; near Mine in Mineral County. It is also recorded in the water of springs at Sou Hot Springs, Buena Vista Valley, Pershing County; in springs at Goodsprings, Clark County; in hot springs near Wabuska, Lyon County; and in Walker Lake, Mineral County. It is found associated with soda and borax in many of the Nevada saline marshes.

The production of anhydrous sodium sulphate (thenardite) is being undertaken at Rhodes Marsh in Mineral County, near Mina. The Rhodes Alkali & Chemical Corp., after a period of experimentation, has developed a method for converting hydrous sodium sulphate (mirabilite) into thenardite, thus eliminating 55 per cent. of the water contained in mirabilite. The crude salt from Rhodes playa contains much mirabilite. The recovery process is conducted in a series of shallow evaporating ponds 800,000 sq. ft. in area. Water from an artesian well is circulated through shallow open pits to dissolve the mirabilite, then pumped to the evaporating and conversion ponds. The salt cake is further dried and prepared for market in a milling plant stated to have a capacity of about 50 tons per day. Rhodes marsh has an area of 11 sq. mi. and is estimated to contain several million tons of available sodium sulphate.

The most important producer of sodium sulphate in Nevada is the American Sodium Co., whose plant and deposit are located 2 mi. east of Wabuska, Lyon County.

An extensive deposit of glauberite occurs in

[13] Mineral Resources of the United States. U. S. Geol. Survey, 1908, p. 32.

Clark County on the west side of Virgin River Valley about 5 mi. south of St. Thomas. It is exposed as a steep slope, 80 to 100 ft. in height and is 1,500 ft. long, bordering the valley floor. A tunnel has been driven into the cliff 200 ft., at the end of which is a winze 40 ft. deep, showing much of the deposit to be a solid crystalline mass fairly uniform in texture, and containing in excess of 2,000,000 tons.

Stone, Gravel and Sand.—Many Nevada towns have near rock quarries from which building stone is produced from time to time. In the city of Reno rock and sand companies operate continuously to supply the builders. Quarries in granite, in hornblende andesite, and in pink rhyolite tuff are located near Reno. The respective varieties of stone are of good quality and much of it has been used for dimension stone.

Excellent granite for monumental and structural stone occurs at Laughton, 6 mi. west of Reno, where it is quarried for all uses. Geologically it is granodiorite of late Mesozoic age. Large areas of suitable granite are also found near Verdi, 10 mi. west of Reno; at Washoe, 15 mi. south of Reno; at Ophir, 20 mi. south of Reno; at Lakeview, near Carson.

Sodium-sulphate evaporation ponds near Wabuska, Lyon County.

Near Luning in Mineral County there is a deposit of fine-grained, white granite. Excellent varieties are found at Mason Valley in Lyon County and at Winnemucca in Humboldt County, where it is quarried for various local uses.

Among the volcanic rocks used in building, a yellowish white quartz-andesite has been quarried and used many years near American Flat, 3 mi. south of Virginia City, Storey County. This rock was extensively used for many purposes at Virginia City during pioneer days, and in the construction of stonework along the Virginia & Truckee R. R. Andesite stone has been quarried for a number of buildings, walls and trimmings in and about Reno.

Sandstone of Pliestocene age occurs in flat, thick beds at the State Prison near Carson. It is yellowish gray in color, is easily quarried, and has medium strength and hardness and good resistance. The State Capitol and other state buildings at Carson, and one building on the campus of the University of Nevada are built of this sandstone.

Great quantities of stone, gravel and sand are used in the construction and maintenance of the state highways. Gravel pits and quarries are located at the most convenient points where suitable material can be obtained along the wide and growing network of macadam and gravel roads. Temporary screening and crushing plants prepare the rock and gravel.

S. C. Durkee, Nevada state highway engineer, states that from 400 to 500 gravel deposits have been used for surfacing, and lists 16 very large and important deposits in various parts of the state.

Of rock or semi-rock quarries used in road building, seven are located along State Route No. 1, which follows very closely the location of the Southern Pacific R. R. to Winnemucca, and the Western Pacific R. R. from Winnemucca east.

Other rock quarries are located at or near Fallon, McGill, Steamboat, Walleys Hot Springs, Caliente, and much rock was also obtained from mine dumps at Virginia City, Goldfield and Tonopah.

Sand of many classes and grades is found in all counties. At Las Vegas the Nevada Products Co. has a deposit of light, sharp lava black sand which is marketed for special uses.

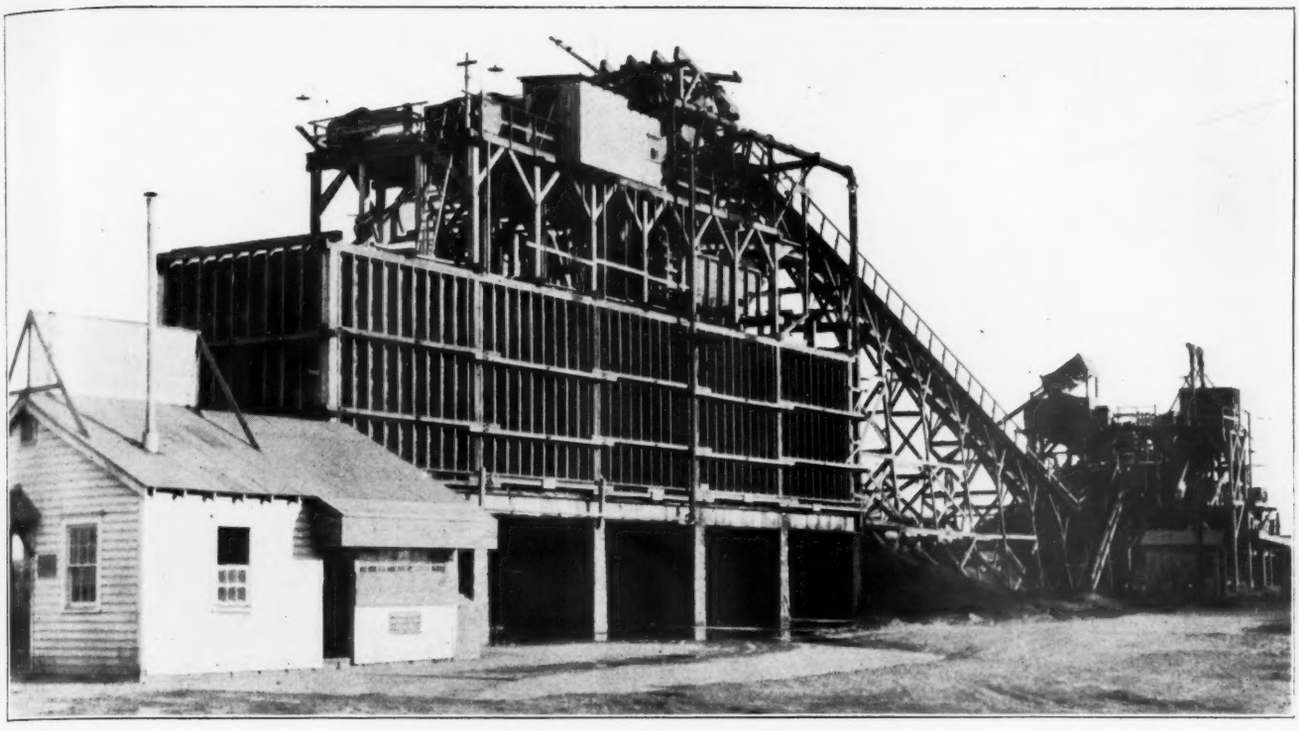
A large gravel-crushing, screening and washing plant has just been completed on Colorado River northeast of Boulder City, and at the damsite is a structural steel concrete-mixing plant equipped with four 4-cu.yd. mixers to turn out 7,000 cu. yd. of cement each 24 hr. The plant has been designed to allow the installation of two additional mixers, if necessary, which will increase the capacity to 10,000 cu. yd. per day.

Sulphur.—Sulphur occurs in the Alum and Cuprite Districts of Esmeralda County; in the Sulphur District of Humboldt County; in the Imlay District in Pershing County; and in the Steamboat Springs District of Washoe County.

A sulphur deposit of large size and unusual character occurs in Humboldt County near the station of Sulphur on the Western Pacific R. R. Mining engineers have estimated 300,000 tons of ore in sight containing from 21 to 40 per cent. sulphur, and a possibility of several million tons more not developed. The deposit has been operated intermittently since pioneer days, when sulphur was hauled by freight teams 35 mi. to Humboldt House on the Southern Pacific R. R., whence it was shipped to markets.

In 1926 the Humboldt Sulphur Co. erected a mill, which for a time produced 30 tons of sulphur per day. About this time the great subterranean sulphur deposits of Texas and Louisiana came into heavy production, developed by drilling and mined by the Frasch steam process. Soon the Nevada plant was compelled to close.

Volcanic Ash.—A deposit of volcanic ash or pumicite occurs 18 mi. southeast of Beatty, Nye County, 3 mi. from the railroad and adjacent to the Beatty, Los Angeles highway. It lies in beds covering about ½ sq. mi. and is at least 20 ft. thick. Much of it has no overburden. Gray-white in color, of very low specific gravity and pulverulent to granular in texture, it has possibilities in the manufacture of light-weight concrete.



Office and plant of the Bristol Sand & Gravel Co.

Pennsylvania Gravel Producer Abandons Dry Excavation of Materials

Water-Level Close to Surface of Deposit Prompts Early Adoption of Dredging Plan

AN interesting example of the changes sometimes necessary in a sand-and-gravel operation to meet changing operating conditions or specifications is presented by the plant of the Bristol Sand & Gravel Co. at Bristol, Pa. When this plant went into operation in September, 1929, its material was excavated by shovel and was hauled to the plant with cars and locomotives. As the water-level on this property is but 12 ft. below the surface, only a small percentage of the material in the deposit could be removed by this method. For this reason it was decided to install a hydraulic dredge when operations were sufficiently advanced, and this machine was put in operation in August, 1931. Because of the increasingly strict specifications for aggregates the cleaner washing made possible by this method was another inducement. Some minor changes have also been made to the plant. The same productive capacity of 200 tons per hr. is now obtained with little more than half the force previously required.

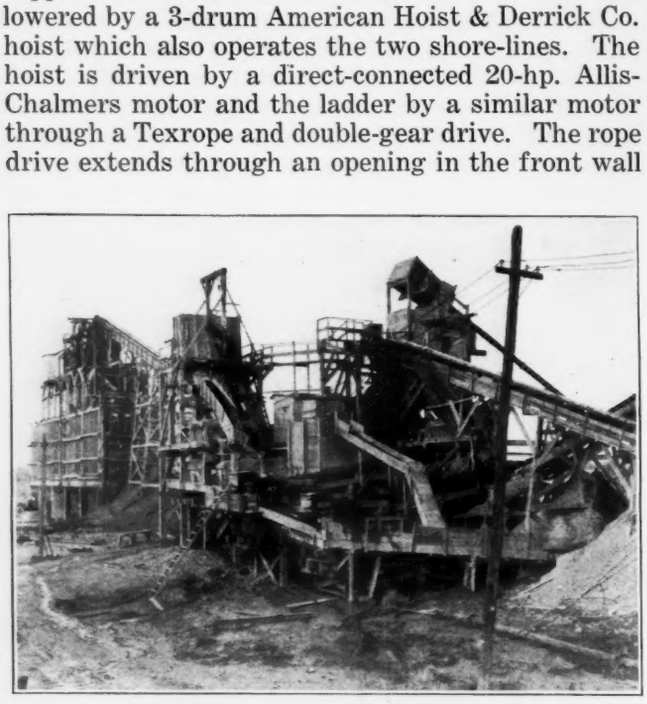
The plant is located about 1½ mi. southwest of Bistol in the Delaware River lowlands, which furnish most of the sand and gravel for Philadelphia and eastern Pennsylvania as well as part of New Jersey. The property consists of 205 acres, the gravel deposit varying in depth from 30 to 50 ft. The 12 to 15 ft. of gravel above water-level, part of which was removed by shovel, averaged about 50 per cent. gravel, of which about 20 per cent. had to be crushed to 1½-in. size. The material below water-level, which is now being dredged, averages 65 per cent. gravel, of which 40 per cent. is crushed. There is only a negligible amount of overburden on the deposit but the material itself contains considerable clay.

Because of these conditions it was decided that dredging would be the ultimate method to be used for economical working of the deposit. With this in mind operations were begun with a 1-cu.yd. Erie crawler steam shovel. This loaded the material into two trains of three 5-cu.yd. Koppel cars each, which were hauled by 12-ton Vulcan gasoline locomotives. These dumped through a grizzly at the plant to the main belt-conveyor.

When the deposit has been opened to a sufficient depth and area, the company installed the dredge, which has some unusual features and merits a complete description. It has no hull, in the accepted meaning of the word, but is supported on a series of 32 steel-barrel pontoons. The main body of the dredge, as well as the section supporting the nozzle and ladder, consists of a structural-steel frame to which the pontoons are securely bolted. This frame is hinged so that the framework supporting the nozzle and ladder is supported by six pontoons. The

superstructure of the dredge has structural framework and corrugated-metal siding and roofing. The only wood used on the dredge is the floor. The dredge proper is 58 ft. long and 30 ft. wide and the extension for the ladder is 30 ft. long.

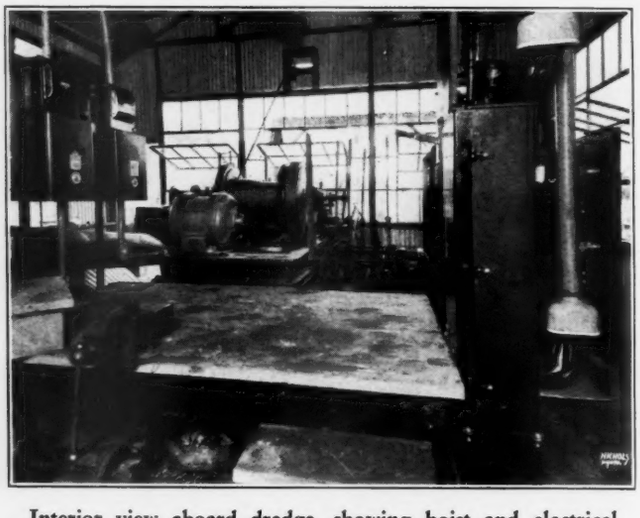
The 30-ft. Eagle-Swintek screen-nozzle-ladder is supported from a steel framework and is raised and lowered by a 3-drum American Hoist & Derrick Co. hoist which also operates the two shore-lines. The hoist is driven by a direct-connected 20-hp. Allis-Chalmers motor and the ladder by a similar motor through a Texrope and double-gear drive. The rope drive extends through an opening in the front wall



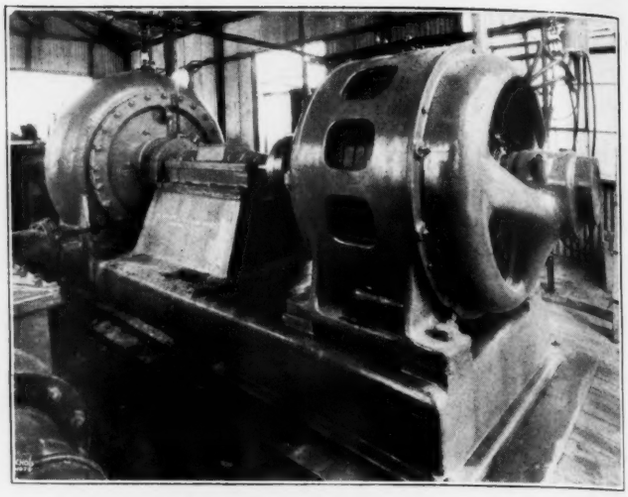
Another view of the plant.

of the dredge, allowing the motor to be protected from the weather.

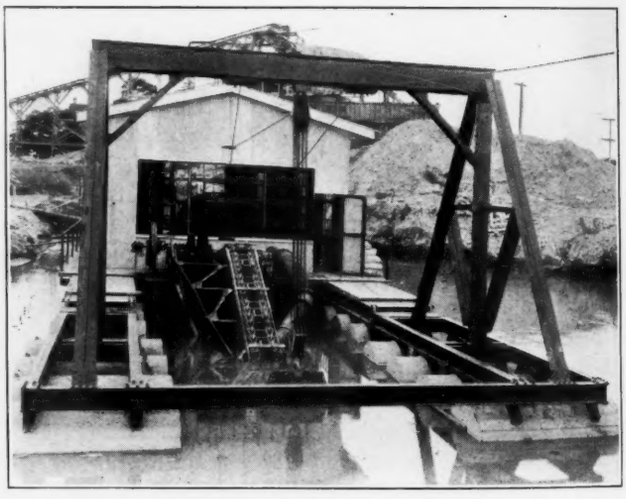
The 12-in. Hetherington & Berner centrifugal dredge pump is direct-connected to a 300-hp., 440-v., 3-phase, 60-cycle induction motor. The pump has the usual sleeve bearings and a Rollway thrust bearing. The dredge-line to the plant is now about 400 ft. long and is supported on steel-barrel pontoons. A flop valve protects the pump from material backing up in the line. Hetherington & Berner rubber pipe-sleeves and suction hose and Naylor spiral pipe are used. Two Westinghouse transformers, alongside the hoist in the fore part of the dredge, reduce the current delivered to the dredge at 4,000 v. to 440 v. for all motors. Another transformer reduces the voltage for lights. A 2-in. Allis-Chalmers centrifugal pump, driven by a 15-hp. motor, is used for priming the dredge pump. Cutler-Hammer starters, Allis-Chalmers switches and electrical equipment, and Crouse-Hinds conduit are used. A 5-ton Yale & Towne chain hoist on an I-beam is used for handling replacement parts. Large steel-sash windows give ample light and ventilation and afford the dredge operator a clear view of all operations. The dredge was designed by the Hetherington & Berner Co.



Interior view aboard dredge, showing hoist and electrical equipment.



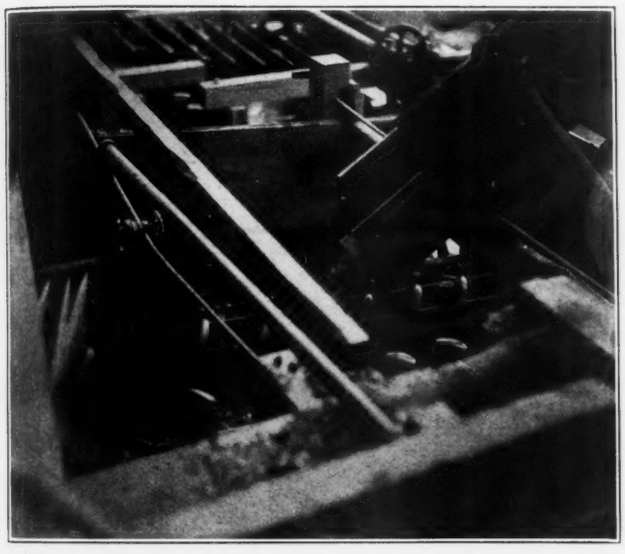
The dredge pump and motor.



Front view of the dredge, showing the ladder.

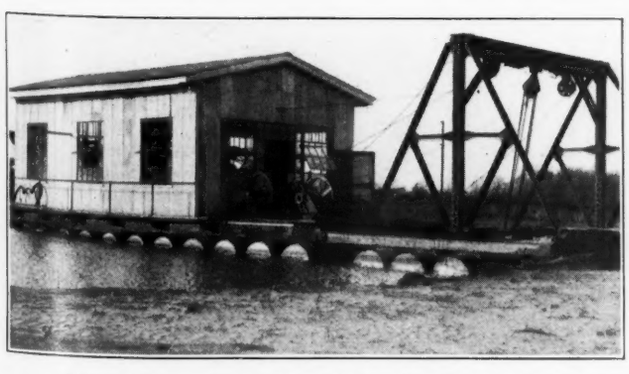
The dredge-line inclines at an angle to a steel-lined box which is set at the same angle and breaks the force of the flow. All the material drops back over a perforated stationary screen, the coarse material going to the bottom of the box. The throughs, sand and water, go to a separate chute. The gravel is fed from the box to a Telsmith 3-ft. by 8-ft. double-deck vibrating screen. Only one deck of this screen is now being used and this has $\frac{3}{8}$-in. openings. The fines coming from it join the fines from the first separation.

The gravel from the vibrating screen is fed by gravity to a 54-in. by 20-ft. Telsmith revolving scrubber-screen which has 2½-in. perforations. The throughs are fed to a belt-bucket-elevator which discharges through a split chute to two 26-ft. McLanahan & Stone log-washers. The oversize drops to a 40-in. Telsmith gyratory reduction crusher which is set at 1½ in. This feeds by a series of two belt-conveyors back to the revolving screen. The sand from the vibrating and stationary screens is split and sent to two 60-in. Telsmith sand-drags, which, together with the log-washers, discharge their product on the main inclined conveyor leading to the top of the screening plant over the bins. The sand goes to the conveyor first, forming a cushion which absorbs the shock caused by the discharge of the gravel on the belt. The overflow of water and silt from the log-washers and sand-drags is flumed back into a worked-out section of the pit.

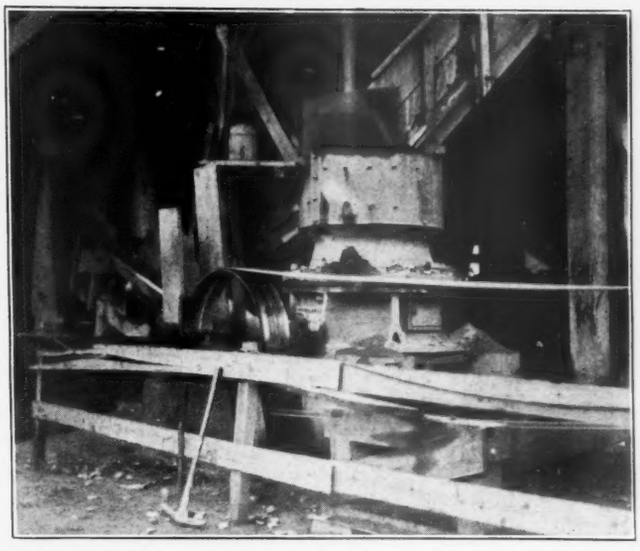


Log-washers and sand-drags in the washing department.

Originally sand screws were used for washing all the material, but these were soon found to be inadequate and were replaced by the sand-drags and log-washers. Part of the belt-conveyor, which originally fed from the track hopper to the plant under the old method, is now used to return crushed oversize to the revolving screen. A Telsmith No. 13-A gyratory primary crusher, which was used before the dredge was installed and was then abandoned, is in place and can be connected when finer crushing is desired or when a coarser section of the deposit is reached.

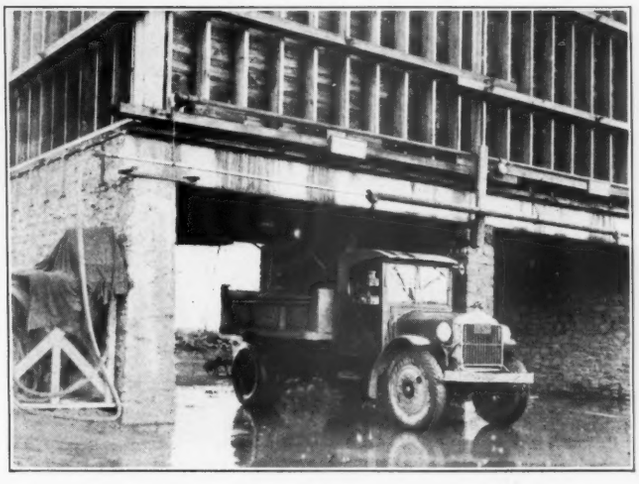


Side view of the dredge. Note the barrel floats.



Gyratory reduction crusher. Return belt-conveyor in background.

The 30-in. main conveyor leading to the top of the screening plant operates on 171-ft. centers and discharges to a 4-ft. by 8-ft. single-deck Niagara vibrating screen having ⅛-in. and ¼-in. perforations. This removes the bar sand. The coarse from this screen goes to a 60-in. by 30-ft. Telsmith rotary scrubber-screen which has a sand jacket and produces three sizes of gravel—1½-in., ¾-in., and ⅝-in.—all which are chuted direct to bin storage. The sand from the vibrating screen goes to Telsmith sand-drag which produces bar sand, the fines from the revolving screen going to a second sand-drag which produces concrete sand. Both materials go directly to storage, while the overflow from both drags goes to waste. The five timber bins have a capacity of 500 tons each. Steel I-beams which support the bottoms of the bins rest on stone piers. Trucks are loaded through two gates under each bin. The ground space under and around the bins and office is paved with concrete.



Truck about to be loaded beneath the bins.

The reduction crusher is belt-driven by a 40-hp. Westinghouse motor which also drives the first return belt-conveyor. The second return conveyor running to the first rotary screen and the screen are both driven by the same 40-hp. motor. The log-washers are driven through Texrope and gears by a single 100-hp. motor. The main 30-in. belt-conveyor leading to the screening plant is driven by a 40-hp. motor which also drives the rotary sizing screen. The plant was designed by the company in coöperation with the Smith Engineering Works. Goodyear conveyor belting and Stearns idlers are used on the belt-conveyors.

Wash-water for the plant is secured from a channel dug several hundred feet out into Delaware River, thus insuring a constant supply in spite of tidal variations. A small timber building houses an 8-in. Worthington pump which is driven by a 100-hp. Westinghouse motor. This wash-water is sprayed into the rotary scalping screen, the log-washers and sand-drags and removes practically all the clay. Additional washing at the screening plant insures a clean product.

Practically all shipments are made by trucks, but these can also dump from a ramp into railway cars at a siding about 1¼ mi. from the plant. This method is used when shipping to the company's yard in Philadelphia or to other points beyond the normal economic range of trucks. A Blaw-Knox 100-ton bin fitted with a weigh-batcher is used for batching materials to trucks for highway paving. A Byers Bear Cat gasoline crane, handling a 1-cu.yd. Blaw-Knox clam-shell bucket, rehandles all stock-piled materials. All truck shipments are weighed on a 20-ton truck-scale fitted with a Howe Weightograph.

The office of the Bristol Sand & Gravel Co. is at 709 E. Chelten Ave., Philadelphia, Pa. The company's officers are: Martin F. Connor, president; Joseph Nolen, vice-president; Martin F. Connor, Jr., secretary; James A. Nolen, treasurer; W. S. Rockhill, general manager and superintendent.

Diesel-Driven Dredge Pump Handles Job Without Aid of Booster

DREDGING and pumping sand over a long distance without the aid of a booster pump was accomplished without difficulty recently by the Independent Sand & Gravel Co. of Wichita, Kan., through the aid of an 8-in. dredge pump driven by a 200-hp. Diesel engine.

The job was a fill at the municipal sewage disposal plant of the city of Wichita. The equipment included a steel dredge boat 18 ft. wide by 32 ft. long by 4½ ft. deep. The engine was a 6-cyl., 9 by 10½ 4-cycle Atlas Imperial Diesel and the pump an 8-in. Amsco, Type S, Form 30, heavy-duty design, right-hand, bottom-discharge, with water end parts made of manganese steel of high-efficiency construction. Gates multiple V-belts were used to transmit the power. The operation was on an average

The pump boat and 8-in. pipe-line.

head of 190 ft., pumping through 2,500 ft. of 8-in. pipe with a vertical head of 24 ft. According to K. S. Richards, Wichita representative of the Atlas Imperial Diesel Engine Co. of Oakland, Cal., the equipment handled in the neighborhood of 50 cu. yd. of material per hr., depositing 75,000 cu. yd. to make the fill. The fuel and lubrication cost was exceedingly low for such an operation, totalling but $736.82.

Other equipment on the dredge boat included a 2 kw. generator for lighting service, the generator being driven off the front end of the engine, a single-

The Diesel engine, pump and V-belt drive before the boat was inclosed.

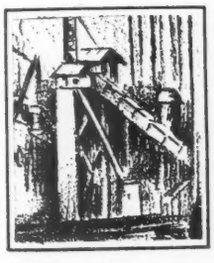
drum hoist for handling the 45-ft. suction hose, and a 2-in. pump for priming and providing circulating water for the dredge-pump bearings. With all this equipment installed on board the boat, it drew only 4½ in. of water.

"This job has caused quite a lot of comment by everyone who has seen it as this (2,500 ft.) is considered a long distance to pump sand without the aid of a booster pump," declares Mr. Richards. "We experienced no difficulties. No shutdown or other expense was charged to any of the equipment during the job. The pump was kept turning in the neighborhood of 780 to 800 r.p.m. continuously in order to obtain the desired results."

MEN OF THE INDUSTRY

JAMES J. CRONIN

MR. CRONIN was recently appointed general manager of the Dolese & Shephard Co., important crushed-stone producer in Chicago. He is widely known in the building-materials field, having formed the Consolidated Co., a Chicago retail concern, in 1915. In 1905, he was a salesman for the old Western Stone Co. Shortly afterward he joined the Wisconsin Lime & Cement Co., where he remained until the formation of the Consolidated Co. In addition to his new duties of managing the affairs of Dolese & Shephard, Mr. Cronin is retaining his position as president of the last-named concern.



Personal Mention

James W. Doody, contractor of Mobile, Ala., and owner of a sand pit just outside the city limits, has been sued for $15,000 damages growing out of the death of 9-year-old James Shaw, who was killed in a cave-in at the pit on April 4. The plaintiff contends that the sand pit was not properly protected.

M. I. Cowen, secretary, Consolidated Products Company, Inc., dealers in used machinery, left New York, July 30 for an extended business and pleasure trip to the West Coast. He sailed to Galveston, Tex., and from there plans to make many stops to renew old and make new business acquaintances on his trip. He will probably return during September.

W. H. F. Thompson has been appointed general manager of the Pioneer Gravel Equipment Co., of Minneapolis and president of Pioneer Equipment Co. (Canada), of Brantford, Ont. Mr. Thompson is a native of Ireland and came to the United States in 1910, taking a post-graduate course in the University of Minnesota. Soon after finishing at the university he joined the sales organization of the Allis-Chalmers Co. After serving in France during the war he returned in 1919 and operated the Enterprise Machinery Co., which was absorbed by the Imperial Machinery Co. in 1924, until 1928, when he became one of the incorporators of the Pioneer concern. He is a director of the manufacturers' division of the American Road Builders' Assn.

E. P. Teel, formerly general superintendent of the Novo Engine Co. has been made vice-president and general manager to succeed **Clarence E. Bement,** who becomes chairman of the board. Mr. Teel has been with the Novo company for 24 years, serving as factory manager as well as closely coöperating with Mr. Bement in managerial work.

Eugene Frost has been appointed director of sales by the Atlas Powder Co., Wilmington, Del., succeeding the late J. W. Mathews. Mr. Frost will have full charge of all selling activities in the explosive department. Mr. Frost entered the explosives business in 1910 as sales manager for the Jefferson Powder Co., Birmingham, Ala. In 1915, when the Jefferson Company was absorbed by the Aetna Explosives Co., Mr. Frost continued with that company until 1921 when he became general sales manager of the Grasselli Powder Co., Cleveland, O. His next advance in the industry was when he became vice-president and treasurer in March, 1922, of the newly organized Peerless Explosives Co. On the merger of the Peerless company with the Union Explosives Co. in 1930, Mr. Frost became vice-president in charge of sales. In March of the current year when the Atlas Powder Company acquired the Peerless-Union, he was made general sales manager.

R. F. Baldwin, who has represented Irving Iron Works, Long Island City, N. Y., in the Philadelphia territory for the past ten years, has been appointed Philadelphia district sales representative by Hendrick Manufacturing Co. of Carbondale, Pa. Mr. Baldwin will handle sales in Southeastern Pennsylvania, southern New Jersey (including Trenton), and the states of Delaware and Virginia. He will continue to make his headquarters at 5813 North Fairhill St., Philadelphia.

W. H. Young has been a patient in a Toledo, O., hospital, following an accident at the slag plant of the France Stone Co., in Toledo. Mr. Young suffered a crushed left hand, the injury being sustained when the member became caught in a piece of machinery at the crushing plant.

Otis Wack, general manager of the Canadian Gypsum Co., has just completed an inspection trip to the plants and quarries of the company, which is a subsidiary of the United States Gypsum Co. Mr. Wack is now spending most of his time on the road through Canada, supervising operations at the plants and quarries of the Canadian company. Previously, for more than 15 years, he was manager of the company's activities in the Windsor area.

L. H. Cole, of Ottawa, Ont., Can., has been chosen chairman of a committee formed recently among members of the Canadian Ceramic Society to formulate standard tests for blasting sands. **S. W. Vickery,** of the Beach Foundry, Ottawa, is secretary.

C. G. Puffett, an employee of the county quarries near Jamesville, N. Y. for more than 15 years, was seriously injured recently while at work lubricating a conveyor roller while the conveyor was in operation. His right arm was drawn into the equipment and was torn off above the elbow.

Coming Events

September 8, 1932. St. Louis, Mo. Monthly meeting, St. Louis Quarrymen's Assn., Forest Park Hotel. E. J. McMahon, exec. sec., 4063 Forest Park Blvd., St. Louis, Mo.

September 20-22, 1932. Chicago, Ill. Annual meeting, Roadmasters and Maintenance of Way Assn.

September 29-October 1, 1932. Pittsburgh, Pa. Annual conference, International Assn. of Public Works Officials.

October 3-7, 1932. Washington, D. C. Twenty-first Annual Safety Congress, National Safety Council. W. H. Cameron, secretary, 20 N. Wacker Drive, Chicago, Ill.

October 5-8, 1932. Atlantic City, N. J. Fall meeting, American Society of Civil Engineers.

November 14-18, 1932. Washington, D. C. Annual meeting, American Assn. of State Highway Officials.

December 5-9, 1932. New Orleans, La. Tenth Annual Asphalt Paving Conference and annual meeting, Assn. of Asphalt Paving Technologists. Under auspices of Asphalt Institute, 801 Second Ave., N. Y.

December 5-10, 1932. New York, N. Y. Tenth National Exposition of Power and Mechanical Engineering. Under management of International Exposition Co., Grand Central Palace. New York, N. Y.

Jan. 16-20, 1932. Detroit, Mich. Highway and Building Congress. Annual Conventions and Combined Show of National Crushed Stone Assn., National Sand & Gravel Assn. and National Ready-Mixed Concrete Assn., Book-Cadillac Hotel.

Traffic News and Comment

Recent I. C. C. Decisions

Cement.—To meet motor-truck competition in the transportation of cement from Hudson and Upper Hudson, N. Y., to Bondsville, Greenwich Village and other stations in Massachusetts, the Boston and Albany reduced the rates which varied from 11½ c. to Middlefield to 13½ c. to Greenwich Village, to 11 c. Requests for suspension came from three points in the Hudson group and 19 mills in the Lehigh district of New Jersey and Pennsylvania, protestants alleging that the proposed reduction would increase the spread in the prices of cement due to the transportation costs, to their disadvantage. The state of Massachusetts is constructing a water system in the Swift River valley near Bondsville and Greenwich Village, the cement required being let in three contracts. The first contract was for 3,000 bbl., all of which moved by truck; the second contract will be for from 30,000 to 40,000 bbl. and the third for about 225,000 bbl. Altogether the loss to the carrier on this and other projects has amounted to between 13,000 and 14,000 bbl. Reductions were made to some points solely to avoid fourth section departures, and no fourth section relief was sought. However, in making its decision, the Commission granted fourth section relief in so far as the long and short haul clause is concerned, and found that the reduced rates, except to stations west of Bondsville, justified. Those found not justified were ordered cancelled. I. C. C. I. & S. Docket No. 3,736.

The Commission has found the rate on imported Portland cement from Corpus Christi, Tex., to Chihuahua, Tex., applicable and not unreasonable or otherwise unlawful. The complaint covered cement imported from Belgium on which an interstate rail rate of 22 c. was collected. At the same time there was in effect on intrastate traffic between the same points a rate of 16 c. Complainant sought the 16 c. rate for the future and reparation on that basis. I. C. C. Docket No. 24,316, Hidalgo County Water Control and Improvement district No. 6, v. St. L. B. & M. et al. (PIT AND QUARRY, Apr. 6, 1932).

Crushed Stone.—The rate on crushed stone from Westfield, Mass., to White Plains, N. Y., has been found not unreasonable or unduly prejudicial, and the complaint has been dismissed. I. C. C. Docket No. 24,618, John S. Lane & Son, Inc., v. N. Y. N. H. & H. et al.

The carriers having justified the restriction of the amount of switching charges to be absorbed on crushed stone from St. Joseph Quarries Co., within the switching limits of St. Joseph, Mo., to interstate destinations, the suspension order has been vacated in I. & S. Docket No. 3,642.

Lime and Ground Limestone.—On account of the Virginia commission refusing to allow the addition of the emergency charge on shipments of lime and ground limestone to the rates prescribed in 163 I. C. C. 701, a further hearing was had, after which the Commission has now decided that the addition of the emergency charge to the intrastate rates is necessary to prevent undue preference and prejudice. New rates are to be made effective not later than Aug. 27. I. C. C. Docket No. 19,943, Sub. No. 1, North American Cement Corp., v. A. & R. et al. (PIT AND QUARRY, May 18, 1932).

Sand.—The rate and switching charge on sand from Memphis, Tenn., to Red Bay, Ala., has been found applicable and the complaint dismissed in I. C. C. Docket No. 24,691, Nixon & Phillips v. I. C. (PIT AND QUARRY, Oct. 21, 1931 and Mar. 9, 1932).

Examiners' Reports

Cement.—Examiner Paul A. Colvin proposes an award of reparation on certain shipments of cement from Bay Bridge, O., to destinations in Wisconsin. The case involved a total of 68 cars of cement, and while he proposes that some of the rates charged be found applicable, they should be found unreasonable to the extent they exceed combinations made up of 13 c. to Manitowoc, Wis., plus the rate beyond, treating both factors with the combination rule. I. C. C. Docket No. 24,949, Medusa Portland Cement Co., v. A. & W. et al.

Sand and Gravel.—Examiner Herbert P. Haley proposes that the Commission find the rate on Sand and Gravel from Attica, Ind., to Arnolds Siding, Ill., not unreasonable and dismiss the complaint in I. C. C. Docket No. 25,090, Neal Gravel Co. v. Wabash.

New Complaints Filed

Cement. — Complainants allege trans-shipment rates on cement from California mills to points in Oregon and Washington, are unduly preferential of California mills and unduly prejudicial to mills in Oregon and Washington, and in violation of Sec. 15a. They also ask for the restriction of trans-shipment rates so they cannot be charged lawfully for the transportation of cement to ports in California when destined for further movement beyond the ports to points in Oregon and Washington. Docket No. 25,428, Beaver Portland Cement Co. et al., Gold Hill, Ore., v. California Central *et al.*

Sand and Gravel.—Complainants seek new rates and reparation on an allegation of unreasonable rate and charges on sand and gravel from Oreapolis, Neb., to Prescott, Ia. I. C. C. Docket No. 25,407, Reed & Wheelock, Clay Center, Kans., v. C. B. & Q. R. R.

The same complaint and prayer be same complainants against same defendants on shipments from South Bend and Oreapolis, Neb., to Bedford, Ia., is being investigated in I. C. C. Docket No. 25,407, Sub. 1.

Sulphur.—Reparation is sought on an alleged violation of section one in connection with shipment of crude sulphur from Baltimore, Md., to Winchester, Va., in I. C. C. Docket No. 25,433, Southern Chemical Co., Hagerstown, Md., v. Western Maryland et al.

Rate-Committee Dockets

New England Freight Assn.

Crushed or Ground Limestone.—Reductions in the rates on broken, crushed or ground limestone, c. l. min. wt. 50,000 lb., from Ashley Falls and Lee, Mass., to destinations on the B. & Ar., are proposed by shippers. Representative rates in Docket No. 26,194 are:

To	Proposed	Present
Caribou, Me.	32½ c.	38½ c.
Ft. Fairfield, Me...	32½ c.	38½ c.
Houlton, Me.	28½ c.	35 c.
St. Francis, Me. ..	34½ c.	42 c.
La Grange, Me. ...	24½ c.	31 c.

Trunk Line Assn.

Crushed Stone.—Shippers at Bethlehem, Pa., propose the establishment of rates on crushed stone,[1] to C. & N. J. and N. Y. & L. B. stations, ranging from 60 c. to $1.60 per net ton. Complete statement of proposed rates will be furnished on request. Docket No. 29,614.

Carriers propose to publish a rate on crushed stone (coated or not coated),[1] from LeRoy, N. Y., to Spring Water, N. Y., of 65 c. per ton plus emergency charge, to expire Dec. 31, 1932. Docket No. 29,619.

A rate of 90 c. per net ton on crushed stone from Watertown, N. Y., to Ogdensburg, N. Y., to expire Dec. 31, 1932, is proposed by shippers. Docket No. 29,620.

Flourspar.—Carriers propose the establishment of a rate on flourspar, c.l. min. wt. 44,800 lb., from Baltimore, Md., to Glens Falls, N. Y., of $4.41 per gross ton. Docket No. 29,502, Sup. 1.

Fluxing Lime.—Shippers propose the following rates on fluxing lime

having no commercial value for building or chemical purposes, c.l. min. wt. 60,000 lb., from B. & O. stations, Alba Marl Lime Co., W. Va., Cedar Creek, Va., Charlestown, W. Va., Frederick, Md., Martinsburg, W. Va., Security, Md., Strasburg, Winchester, Va., districts to Brackenridge, Vandergriff and Verona, Pa., $1.90 and to Farrell, Pa., Follansbee, W. Va., Haselton and Lowellville, O., Midland and Sharon, Pa., Steubenville, Toronto and Warren, O., Weirton, W. Va., Youngstown, O., and Erie, Pa., $2.40 per net ton. Docket No. 29,584.

Central Freight Assn.

Amiesite.—Shippers at Miamiville, O., propose the establishment of rates on gravel or crushed stone to which has been added oil, tar or asphalt, to destinations in Kentucky on the L. & N., the C. & O. and the Southern on the basis of 20 c. per ton over the GC 1,805 scale. This will generally result in reductions. Docket No. 32,408.

Crushed Stone.—Carriers propose a reduction in the rate on crushed stone from Monon, Ind., to Buchanan, Three Oaks, and Niles, Mich., from $1.01 to 95 c. per net ton. Docket No. 32,407.

A reduction in the rate on crushed stone from Bloomville, O., to Mansfield, O., from 60 c. to 50 c. per net ton is proposed by shippers.

Shippers propose a reduction in the rate on crushed stone from Painesville and Perry, O., to Cleveland, O., from 80 c. to 60 c. per net ton. Docket No. 32,480.

A reduction in the rate on crushed stone and related articles from Maple Grove, O., to Wadsworth, O., via P. R. R., Mansfield, Erie, from $1.15 to 80 c. per net ton is proposed by shippers.

Carriers propose to publish a commodity rate on crushed stone from Monon, Ind., to Eau Claire, Mich., of $1.15 per net ton. Docket No. 32,504.

Dolomite.—Shippers at Carey, O., propose a reduction in the rate on raw or crude dolomite to Huntington, W. Va., from $2.02 per net ton, to $1.66 per gross ton. Docket No. 32,513.

Crushed Stone, Sand, Gravel and Slag.—Carriers propose to reduce the rate on crushed stone, gravel, slag and common sand, from Buffalo, N. Y., to Concord and Union City, Pa., from $1.10 to $1.00 per net ton. Docket No. 32,476.

Sand.—Shippers propose the establishment of a commodity rate on sand and sand-loam from Milwaukee, Wis., to Toronto, Ont., of $3.65 per net ton. Docket No. 32,410.

Carriers propose to publish a commodity rate on moulding sand from Detroit, Mich., to Saginaw, Mich., of $1.64 per net ton. Docket No. 32,380.

Sand and Gravel.—Shippers at Sandusky, O., propose a reduction in the rate on sand and gravel to Crestline, O., from $1.00 to 75 c. per net ton. Docket No. 32,379.

A reduction in the rate on common sand and gravel from Peru, Ind., to Walkerton, Ind., from 76 c. to 60 c. per net ton, to expire Dec. 31, 1932, is proposed by shippers. Docket No. 32,483.

Slag.—Carriers propose to publish a commodity rate on slag in open-top cars, from Hamilton to Xenia, O., of 70 c. per net ton. Docket No. 32,471.

Illinois Freight Assn.

Amiesite.—It is proposed to establish the same rates on gravel, coated with oil, tar or asphaltum, as now apply on crushed stone with the same coating, between points in I. F. A. territory. Docket No. 3,339. Sub. 3-A.

Sand and Gravel.—It is proposed to reduce the rate on sand and gravel,[1] from the Ottawa-Utica district to Lincoln, Ill., from $1.39 to $1.30 per net ton. Docket No. 6,749.

A reduction in the rate on sand and gravel,[2] from Chillicothe, Ill., to Cameron, Ill., from 88 c. to 80 c. per net ton, is proposed. Docket No. 3,330-Q.

Western Trunk Line Committee

Amiesite.—Shippers propose the establishment of commodity rates on crushed stone coated with oil, tar or asphaltum, or on natural asphalt rock, from Kansas City and Pixley, Mo., to destinations in Kansas, made on the basis of the distance scale of rates prescribed in I. C. C. Docket No. 23,094 and Sub. 1, the c.l. min. wt. to be changed to Note 1 instead of 40,000 lb. Docket No. 4,781-K.

On shipments of amiesite from Kansas City and Pixley, Mo., to destinations in Missouri it is proposed to establish the scale of rates shown in Item 926-D of W. T. L. Tariff 91-F of joint hauls and as shown 1,050-D of Mo. Pac. Tariff 6,172-E, on single-line hauls. The c.l. min. wt. is to be changed from 40,000 lb., to Note 1. Docket No. 4,781-L.

Sand.—Shippers propose a reduction in the rate on sand, pumice and volcanic ash, c.l. min. wt. 60,000 lb., from Calvert, Kans., to Chicago, Ill., from 23½ c. to 23 c. per 100 lb. Docket No. 6,975-D.

A reduction in the rate on sand,[1], from the Ottawa-Utica district in Illinois to Omaha, Nebr., from 15½ c. per 100 lb., to $2.70 per net ton, is proposed by shippers. Docket No. 8,024. Sub. 1.

Southwestern Freight Bureau

Agricultural Limestone.—Shippers at Rock Hill, Mo., have asked to have that point included in Item 1,105-H of W. T. L. Tariff 91-F, naming rates on agricultural limestone from various producing points in Missouri, to enable shippers to market their product. Docket No. 25,308.

Lime.—Carriers propose to publish a rate on lime in S. W. L. Tariff 58-Q, of 22½ c. from Group 1, and 24 c. from Groups 2 and 3, to stations on the T. & P. in Louisiana as provided in Item 430-S of the tariff, indexed as follows: 9,100 to 9,545; 9,950 to 9,945; 10,235 to 10,290, all numbers inclusive. Docket No. 25,289.

Shippers at Osceola, Mo., have asked for the publication of a rate of 29½ c. per 100 lb., on lime, c.l. min. wt. 30,000 lb., to Atreco, Beaumont, Chaison, Port Arthur and South Beaumont, Tex. Docket No. 25,334.

[1] The carload minimum weight will be 90 per cent. of the marked capacity of the car, except when car is loaded to full cubical or visible capacity, actual weight will apply.

[2] The carload minimum weight will be the marked capacity of the car, except when car is loaded to full cubical or visible capacity, actual weight will apply.

Incorporations

ROYAL QUARRYING & MANUFACTURING CORP., Elberton, Ga. E. J. Gomez and H. I. Molitch, of Philadelphia, and Jose Canalos, of Elberton.

FALLS ROAD STONE QUARRY, INC., Baltimore, Md. 2701 Falls Road. John M. Hammond and Lawrence R. Collins.

GREENFIELD QUARRIES CO., Cincinnati, O. 250 shares n.p.v. Dolle, O'Donnell & Cash, 3715 Carew Tower.

FAIRGROUND SAND & GRAVEL CO., Huntington Station, N. Y. 100 shares common. Partridge & Sullivan, Northport, N. Y.

VALLEY SAND & GRAVEL CO., Davenport, Ia. Capital $10,000. B. H. Kelly, president; Wilfred W. Behm, secretary-treasurer.

JAMES RIVER HYDRATE & SUPPLY CO., Indian Rock, Va. Capital $200,000. L. P. Dillon, Indian Rock, Va., president; J. H. McNamara, Eagle Rock, Va., vice-president; F. C. Dillon, Indian Rock, Va., secretary-treasurer.

Ohio Engineer Perfects Machine for Plastering

A machine for plastering and laying mortar for bricks has been developed by F. J. Spayth, Lima, O., engineer.

According to Mr. Spayth, the machine is portable and may be moved about a building by one man. Mortar is mixed in a hopper and is pumped through a discharge hose to the point of use. With a little experience, the craftsman may plaster the walls of a room in much less time than by present methods. The material flows from the end of the hose and which is held by the craftsman with one hand, using the other to trowel it into place.

Robins Conveying Belt Co., New York, N. Y., has opened the following branch sales offices: 229 Rockefeller Bldg., Cleveland, Robert Wisely, representative; 16170 La Salle Blvd., Detroit, M. S. Lambert, representative; 7146 Dartmouth Ave., St. Louis, H. J. Martini, representative; and 905 Edgewood Ave., Charleston, W. Va., R. U. Jackson, representative.

Financial News

The information contained in these financial pages is given with the understanding that any statement on the part of this magazine or any of its staff, as to the responsibility or standing of any person, firm or corporation, or as to the value of any property or securities is a mere expression of opinion, given as a matter of service to the readers of PIT AND QUARRY, *for which no responsibility in any way is to attach to this magazine or to any of its staff.*

International Statement Shows Some Trade Gain

Consolidated profit and loss statement of the International Cement Corp. and subsidiaries, giving the results from operations for the second quarter of 1932 as compared with the results for the first quarter of 1932 were as follows:

	Second Quarter	First Quarter
Gross sales	$3,888,693.22	$3,219,764.79
Less: Pkgs., disc. & allowances	847,012.79	633,747.49
Net sales	$3,041,680.43	$2,586,017.30
Mfg. cost, exc. dep.	$1,603,685.96	$1,350,683.38
Shipping, selling and adm. exp.	796,037.93	849,577.56
	$2,399,723.89	$2,200,260.94
Operating profit	$ 641,956.54	$ 385,756.36
Int. charges and financial exp.	173,065.13	199,735.88
Net prof. bef. res.	$ 468,891.41	$ 186,020.48
Reserves for contingencies, etc.	$ 127,184.68	$ 128,763.20
Reserve for dep.	691,235.31	466,970.69
	$ 818,419.99	$ 595,733.89
Net loss	$ 349,528.58	$ 409,713.41

"From the foregoing you will note that the net loss for the second quarter amounted to $349,528.58 compared with a loss of $409,713.41 for the first quarter," said Holger Struckmann, President, in transmitting the report to stockholders. "This loss is after interest on gold debentures, reserve for taxes and all other charges including depreciation of $691,235.31 for which there was no cash expenditure.

"Shipments continue at low volume on account of general depressed conditions but prices in some of our territories have improved substantially of late."

U. S. Gypsum Nets 57c. on Common in 6 Months

The United States Gypsum Co. has declared the regular quarterly dividends of 40 c. on the common and $1.75 on the preferred stocks, both payable October 1 to stock of record September 15.

The company and its subsidiaries report for the six months ended June 30, 1932, net income of $963,789 after depreciation, federal taxes, etc., equivalent after dividend requirements on 7 per cent. preferred stock, to 57 c. a share (par $20) on 1,218,349 shares of common stock. This compares with $2,241,560, or $1.62 a share on 1,216,956 common shares in first half of 1931.

Current assets as of June 30, 1932, including $11,870,711 cash and marketable securities, amounted to $18,205,431 and current liabilities were $769,460. This compares with cash and marketable securities of $10,149,820, current assets of $18,572,107 and current liabilities of $1,622,736 on June 30, of the previous year.

Income Account

	1932	1931
Operating profit	$1,748,641	$3,448,596
Other income	280,757	397,867
Total income	$2,029,398	$3,846,463
Depreciation & depletion	899,668	1,126,681
Miscellaneous deduct.	52,485	174,965
Income taxes	113,456	303,257
Net income	$ 963,789	$2,241,560
Preferred dividends	273,777	274,459
Common dividends	951,959	973,267
Deficit	$ 261,947	*$ 993 834

* Surplus.

Assets

	1932	1931
*Plant & equipment	$40,308,936	$49,397,280
Cash & work funds	1,032,762	540,095
Accounts, notes and const. contr.	3,141,095	4,622,787
Marketable securities	10,837,949	9,609,725
Inventories & supplies	3,193,627	3,799,502
Empl. stk. purch. contr.	1,558,690	1,651,870
Dep. for ins. res.	180,258	180,868
Miscellaneous secur.	120,787	87,821
Deferred charges	1,160,359	1,043,776
Total	$61,534,463	$70,933,724

Liabilities

Preferred stock	$ 7,822,200	$ 7,841,700
Common stock	24,366,980	24,339,120
Accounts payable	291,992	694,743
Accrued payrolls, etc.	211,054	293,839
Federal taxes	266,416	634,155
Contg. & other res.	1,374,727	1,404,369
Paid-in surplus	6,498,172	6,496,401
Earn surplus	20,702,922	29,229,397
Total	$61,534,463	$70,933,724

* After reserve for depreciation and depletion.

Commenting on the company's operation in first six months, Sewell L. Avery, president, said: "The balance sheet and statement of earnings reflect the results of a continued decline in construction. Building demand for the period was the lowest since 1915, and has permitted the use of less than a quarter of the company's productive capacity. This condition has required drastic reductions in productive cost and in sales and administrative expenses.

"The building of new mills and the decline in business have reduced the value of some of the older plants. Based on the tonnage allocated to such plants, the board of directors at the May meeting authorized a reduction of plant account of $7,700,000 to meet this condition. The balance sheet gives effect to this revision as of January 1, 1932."

Since the first of the year United States Gypsum's accounts, notes and construction contracts receivable, less reserves, have been reduced around $100,000 and inventories have declined more than $500,000. Cash and government securities were increased during this period about $700,000, of which around $100,000 was an increase in cash. Accounts payable are $285,000 less than at the close of 1931.

The consolidated net profit figure includes earnings of the company's Canadian subsidiaries which were converted at the average rate of exchange for the six-months' period. Adjustment of balance sheets of Canadian subsidiaries as of June 30, 1932, for depreciation in Canadian exchange has been charged to earned surplus.

St. Paul Producer Gets Out Effective Circular

"A Concrete Story Told in a Concrete Way," is the title of a four-page promotional circular just issued by the Guaranteed Concrete Co. of St. Paul, Minn.

The circular for its text quotes from a paper read by Cloyd M. Chapman at the last convention of the Ready-Mixed Concrete Assn. at Pittsburgh. Printed in two tones of blue on special laid paper and accompanied by attractive illustrations done in the modern massive manner, it is proving an especially effective piece of advertising.

DIVIDENDS DECLARED AND AWAITING PAYMENT

Company	Class of Stock	Dividend Rate	Holders of Record	Payable	Company	Class of Stock	Dividend Rate	Holders of Record	Payable
Calaveras Cement	Preferred	$1.75 qr.	June 30	July 15	Riverside Portland Cement	1st Pfd.	$1.50 qr.	July 15	Aug. 1
Cleveland Quarries	Special	$0.50 qr.	Aug. 10	Sept. 1	Superior Portland Cement	Class A	$0.27½M	Aug. 23	Sept. 1
Cleveland Quarries	Common	$0.10 qr.	Aug. 15	Sept. 1	Superior Portland Cement	Class B	$0.12½	June 15	July 20
Consolidated Sand & Gravel	Preferred	$0.50 qr.	July 30	Aug. 15	Texas Gulf Sulphur	Common	$0.50 qr.	Sept. 1	Sept. 15
Fitzsimons & Connell	Common	$0.25 qr.	Aug. 20	Sept. 1	U. S. Gypsum	Preferred	$1.75 qr.	Sept. 15	Oct. 1
Pacific Portland Cement	Preferred	$1.62½ qr.	June 30	July 5	U. S. Gypsum	Common	$0.40 qr.	Sept. 15	Oct. 1
Pennsylvania Salt	Common	$0.75 qr.	June 30	July 15	Worcester Salt	Preferred	$1.50 qr.	Aug. 4	Aug. 15

Foreign Developments

Hydraulic Hardening Is Surface Reaction, Claim

Many of the disputes that have arisen about the old colloidal-swelling theory of Michaelis, expounded 25 years ago at a meeting of the Association of German Portland Cement Manufacturers (where the present paper was delivered), have arisen because Michaelis' theory has not been rightly understood. Michaelis never denied the formation of crystals, but explained it as incidental and denoted the formation of a colloidal mass as the distinguishing and essential thing about all hydraulic mortars. His theory has been questioned mainly because crystalline formations can be recognized with the microscope, but it must be insisted that the colloid-chemical explanation does not exclude the occurrence of crystals, nor does the crystalline explanation exclude the occurrence of colloidal formations. It is of decided importance to clear up this diversity of opinion, for the means to increasing tensile strength are still unknown, and the questions of permeation and even of chemical resistance are different in aspect as one or the other explanation is established.

Either the crystalline or the colloidal hardening is, of course, possible. Gypsum is an example of the first, agate and flint of the second. For an example of the colloidal shrinking process, the author prepared a vitreous fusion rich in lime, ground it and let it harden under the influence of CO_2—free potash-lye. X-ray investigations showed no formation of crystals after 28 days, yet the tensile strength after 3-day water-storage was 21.6 kg./sq. cm., showing the possibility of good hydraulic hardening on the basis of colloid chemistry. Further evidence is drawn from the recent works of Dorsch and Guttman, and from the behavior of the calcium-aluminates: the aluminates low in lime harden along with the formation of free aluminum-hydroxide. Even the hardening of aluminous cement is undoubtedly a phenomenon of colloid chemistry.

Furthermore the phenomena of swelling and shrinking can scarcely be explained by assuming a crystalline hardening. These are decidedly surface reactions that can only occur if the individual particles have a diameter of not more than 0.1 micron. Such "colloids" should not be confused with the idea "amorphous," as they may be fine-crystalline; but the first new formations in the hardening of cement are actually amorphous. With the exception of Portland cement, swelling silicate binders are always low in lime; in Portland cement a swelling system must first be produced by a preliminary reaction in which a part of the lime goes into solution; under the action of the so formed lime-water the spongy skeleton then swells.

In investigations conducted by the author in connection with Wang, Berchen and Kaempfe, and partially published previously, cement grits rather than finely ground cement were treated with the same reagent fluid that forms when cement is mixed; by proper decanting and filtering each system can be divided into reagent fluids, new formations and cement grits, the components differing between the different cements. After eight hours, in the case of Portland cement, the content of alumina in the new formations is about twice as great as the silica, while the original cement contained more than three times as much silica as alumina. After twenty days the proportions have been restored to their original ratio. Iron and magnesia compounds take slight part in this process. The increase of lime in the reagent fluid can only be explained by the breaking down of the tricalcium-silicate; thus the hydration of the tricalcium-silicate takes place exactly as Michaelis believed.

In the hydration of the aluminates also there is first a solution, from which hydro-aluminates again separate. The hydration of the tricalcium-aluminate takes place rapidly, although not so violently as that of the tricalcium-silicate. The Brownmiller compound hydrates considerably more slowly and with its ferritic part even sluggishly.

In the case of the remainder of the tricalcium-silicate it appears that after the loss of lime it preserves its structure, water taking the place of the lime. Yet it is probable that the molecule is broken down, forming that colloidal hydro-silicate which gradually forms a layer of gel around the cement grain.

As to alumina cement it was found that the monocalcium-aluminate goes into solution violently and hydrates to dicalcium - hydro - aluminate and aluminium hydroxide; both at first remain in colloidal solution, but later separate out, forming gel. In aging, at least the dicalcium-hydro-aluminate gradually becomes crystalline. Very slight quantities of silica were found in the new formations, even after considerable time had passed.

In the investigation of blast-furnace slag it was found that the alumina, if enough lime is available, tends to form a hydro-aluminate of highest possible lime content. On the other hand, the silicate compounds in the slag always yield hydro-silicates low in lime as compared to the aluminates. In proportion to the lime concentration in the fluid phase the same new formations are probably yielded as in Portland or alumina cement, which is particularly interesting because Kanter objected to Michaelis' using the same bases of investigation for slag as for cement.

In all cements the aluminates go into solution, hydrate and separate out again as preëminently colloidal new formations, while the silicates take up water from the system and hydrate to a colloidal gel mass surrounding the reagent particle. Thus Michaelis prophetically recognized not only the reaction process that is always present, but even the mechanism of the reaction.—Dr. Hans Kühl in *Zement* 21:392-397 and 405-410, July 7 and 14, 1932 (paper at meeting of Association of German Portland Cement Manufacturers, Berlin, Mar. 16, 1932) and (summary) *Tonindustrie-Zeitung* 56:371-2, Apr. 4, 1932.

Aluminium Sulphate Is Found to be Injurious

At the recent congress of industrial chemistry at Paris, K. Th. Kawassiades, professor of chemistry at the Evelpidon military school in Athens, reported a series of tests on the effect of aluminium sulphate on different cements and concretes. These studies were conducted at the University of Liege. They are of practical interest in that aluminium sulphate can be formed in argillaceous soils at the same time containing pyrites, or by the action of sulphuric acid, in the vicinity of plants using or producing this material, on clayey soils. The investigations showed clearly a harmful action on concretes if the water contain more than 10 grams of hydrated aluminium sulphate per liter in solution, the cause being the formation of Candlot's salt (calcium sulpho-aluminate) and the production of calcium-sulphate crystals to the detriment of lime. With less than 10 grams the action is still injurious, though of course in lesser degree, and the action includes the formation of the Candlot salt but not gypsum. In the comparisons of the various cements it was found that alumina cement resists the effects of the salt better than the others; this, however, is not due to greater resistance to chemical action as such but rather to the greater impermeability of the alumina cement or perhaps the manner in which the calcium-sulphate crystals form.—*Revue des Materiaux de Construction* No. 273, pp. 230-231, June, 1932.

Recent Patents

AMERICAN

Cement

Process for the manufacture of cement. Veuve G. Lepine, Meaux, France. No. 1,868,240.

Crushing

Crushing apparatus. Edgar B. Symons, Hollywood, Cal., assignor to Nordberg Mfg. Co., Milwaukee, Wis. No. 1,868,338.

Drilling

Drill. Harry C. Norley, North Bay, Ont., Canada, assignor to Canadian Atlas Steels, Limited, Welland, Ont., Canada. No. 1,867,950.

Rotary drill-bit. Jesse C. Reese, Montebello, Cal., assignor to Reese Engineering Co. No. 1,868,074.

Feeding device for rock drills. William A. Smith, Sr., Easton, Pa., and William A. Smith, Jr., Philipsburg, N. J., assignors to Ingersoll-Rand Co., Jersey City, N. J. No. 1,868,294.

Rock-drill support. Edward F. Terry, Jr., Denver, Colo., assignor to Gardner-Denver Co., same place. No. 1,868,373.

Mounting for rock drills. Russell H. Wilhelm, Easton, Pa., assignor to Ingersoll-Rand Co., Jersey City, N. J. No. 1,868,650.

Back-head construction for rock drills. Gustave M. Nell, Detroit, Mich., assignor to Chicago Pneumatic Tool Co., New York, N. Y. No. 1,868,670.

Safety device for rock drills. Lewis C. Bayles, Easton, Pa., assignor to Ingersoll-Rand Co., Jersey City, N. J. No. 1,868,685.

Excavator Accessories

Bucket tooth. Edward B. Birkenbeuel, Portland, Ore. No. 1,867,871.

Bucket (drag type). John W. Page, Chicago, Ill. No. 1,868,246.

Materials Handling

Loader for skip-hoist buckets. William E. Hale, Chicago, Ill., assignor to Webster Mfg. Co., same place. No. 1,868,319.

Apparatus for handling loose material. Alfred B. Esseltine, Chicago, Ill., assignor to Goodman Mfg. Co., same place. No. 1,868,973.

Mixing

Apparatus for mixing material for making roads. Walter G. Frazer, Cedar Rapids, Ia., assignor to Iowa Mfg. Co., same place. Nos. 1,867,739 and 1,867,817.

Truck concrete mixer. Gebhard Jaeger, Columbus, Ia., assignor to Jaeger Machine Co., same place. No. 1,867,838.

FOREIGN

Blasting

Black blasting powder. Atlas Powder Co., assignee of Roy L. Hill, Wilmington, Del. Canadian 324,086.

Blasting explosive. Canadian Industries, Ltd., Montreal, Que., assignee of Frank H. Bergeim, Leonia, N. J. Canadian 324,117.

Gelatinous explosive composition. Canadian Industries, Ltd., Montreal, Que., assignee of Leon O. Bryan, Wilmington, Del. Canadian 324,118.

Crushing and Grinding

Ore-disintegrating apparatus. The Hardinge Co., Inc., assignee of Harlowe Hardinge, York, Pa. Canadian 323,936.

Process and apparatus for grinding or crushing. N. Nielsen. British 375,480.

Rock crushers of gyratory or other type. L. Mellersh-Jackson (Traylor Engineering & Manufacturing Co.). British 375,520.

Roller-and-ring mills. W. W. Triggs (Combustione Economica e Impianti Elettrici Soc. Anon.). British 375,722 and 375,730.

Cement-grinding method. International Precipitation Co., Los Angeles, Cal., assignee of Gustav A. Witte, Catskill, N. Y. Canadian 324,154.

Drilling

Drilling tools. Consolidated Pneumatic Tool Co., Ltd., and T. Seaman. British 375,592.

Rock drills. J. Scheeren and M. Stiller. British 375,596.

Drilling equipment. William D. Grant, Vancouver, B. C. Canadian 324,549.

Materials-Handling

Car dumpers. F. W. Hollick and Babcock & Wilcox, Ltd. British 375,490.

Conveyor belts. J. Littlewood and M. F. Higgins. British 375,700.

Cranes. Sir W. Arrol & Co., Ltd., and R. G. Shepherd. British 375,711.

Screening and Separating

Electric precipitator. Siemens-Schuckertwerke Akt.-Ges., Berlin-Siemensstadt. German 553,068.

Conveyor-operated screening device. General Chemical Co., New York, N. Y., assignee of Harold A. Davis, Chicago, Ill. Canadian 324,146.

Centrifugal separator. International Precipitation Co., assignee of Marcel A. Lissman, Los Angeles, Cal. Canadian 324,153.

Separator for dry materials. Colin W. H. Holmes, Ivor L. Bramwell and Birtley Iron Co., Ltd., Birtley, England. Canadian 324,215.

Separation of dry materials. Ivor L. Bramwell and Birtley Iron Co., Ltd., Birtley, England. Canadian 324,217.

Unclassified

Methods of and apparatus for fusing silica and the like. British Thomson-Houston Co. British 375,500.

Apparatus for the collection and evacuation of air charged with dust particles. P. J. Segui. British 375,528.

Colloidal silica refractory material. Orazio Rebuffat, Naples, Italy. Canadian 324,068.

PIT AND QUARRY *will furnish, at its actual cost, a copy of any patent cited here. A charge of ten cents per copy is made by the U. S. Patent Office, Washington, D. C., and readers may procure a copy directly by addressing the Commissioner of Patents, with payment for copies requested. Postage stamps are not accepted by the Patent Office. We will endeavor to obtain copies of foreign patents for our readers but we cannot give assurance in every case for the reason that copies of such patents are not printed for distribution as liberally as are the American copies, nor is there a fixed charge per copy.*

Gravel Producers Offer Important Sales Market

Sand-and-gravel producers have been important buyers of equipment this season despite the slump and, with the clouds in the business sky fast clearing away, are expected to release orders shortly for considerable much-needed machinery and supplies.

The Cincinnati Rubber Mfg. Co. reports the sale of conveyor belting to a number of producers, some of the more important including the Wissota Sand & Gravel Co., Eau Claire, Wis., which purchased 384 ft. of 30-in. belting; Willey-Ruckstuhl Co., Cincinnati, O., purchasers of 587 ft. of 24-in. belting and 316 ft. of 18-in. stock. The Miami Gravel Co., also of Cincinnati, took delivery on 600 ft. of 18-in. 5-ply belting a short time ago.

Many new screen installations have been reported by Simplicity Engineering Co., of Durand, Mich. Of particular interest are the sale of four double-deck and one single deck gyrating screens and two D'centegrators installed on the dredge *Kentucky*, owned by the Ohio River Sand & Gravel Co., of Louisville, Ky. The Construction Materials Corp. of Chicago recently ordered and put in service two double-deck screens, while a similar order was recently consigned to the New Kensington plant of J. K. Davison & Bro. of Pittsburgh. Two doubledeck models and a Simplicity D'centegrator were installed a short time ago at the new plant of the Grand Rapids Gravel Co., of Grand Rapids, Mich.

A number of Caterpillar tractors and LaPlant-Choate roll-over scrapers are being used for the first time in Iowa this year in opening up gravel pits to supply material for road building.

A. M. Castle & Co. has been appointed the distributor of the Babcock & Wilcox Tube Co. products in the Chicago and Pacific Coast territories.

This company is the only distributor representing the Babcock & Wilcox Tube Co. in the Chicago district and is the exclusive distributor and sales agent for B & W tubes on the Pacific Coast.

Manufacturers' Publications

Copies of any of these publications may be had by writing the manufacturers who publish them. Please mention PIT AND QUARRY *when writing.*

Car Dumpers

Engineering Achievements. 4 p. (No. 9 of a Series. The Wellman Engineering Co., Cleveland, O.) A folder describing the development of the more important machinery made by this firm. It features the Wellman revolving car dumper used by the cement and other industries to reduce the cost of unloading materials from railway cars.

Drilling

Rock Drills. 4 p. (Bull. W1201-Slat.) Worthington Pump & Machinery Corp., Harrison, N. J.) A new catalogue recently released by this concern describing hand-held drills for light-, medium-, and heavy-duty service in quarries and excavating projects.

Engines, Gasoline

Waukesha's Answer to Management's 5 Vital Questions. Folder. (Waukesha Motor Co., Waukesha, Wis.) A concise mailing piece answering the queries of the executive, engineer, sales manager, service manager and purchasing agent regarding the new Full-Power gasoline engines recently brought out by this company. Contains details of vital parts and engine specifications.

Excavating

The Line. 24 p. (The Marion Steam Shovel Co., Marion, O.) Presents briefly in text and illustration the complete line of shovels, draglines, clam-shells and cranes produced by the company. Capacities range from 1¼ to 20 cu. yd.

The New Champion Cleanup Rehandler. 4 p. (The Wellman Engineering Co., Cleveland, O.) Describes and illustrates a new clam-shell bucket for cleanup and rehandling service. Features are high speed in operation, increased digging power, roller-bearing sheaves and bronze bushings on all moving parts.

Motors, Electric

G. E. Splash-Proof Motors. 2 p. (Bull. 1619. General Electric Co., Schenectady, N. Y.) Briefly describes and illustrates squirrel-cage induction motors of splash-proof construction, designed for applications in which open-motor operation is handicapped by the presence of splashing or dripping liquids. Built in sizes of ½ to 75 hp. in standard speeds and voltages.

Rubber Goods

Engineering Data, Industrial Rubber Goods. 24 p. (The B. F. Goodrich Rubber Co., Akron, O.) A new, condensed catalogue of engineering information and data and a simplified line-up of the principal industrial rubber goods made by this concern. A table on rubber transmission belting gives at a glance, horsepower capacities, minimum pulley diameters, leather-belt equivalents and prices on transmission belts. Another table, never before published, aids the engineer in estimating the pressure required to deliver a desired amount of liquid through a hose of various diameters.

Wire Cloth

Wire Cloth Handbook. 104 p. (Cat. No. 32. Newark Wire Cloth Co., Newark, N. J.) A new catalogue and handbook on wire cloth and wire-cloth products. In addition to cataloguing the firm's products, it contains interesting data and information. The glossary of wire cloth terms explains the meaning of "mesh," "gauge," "count," etc.

Wire Rope

Pointers on the Care of Wire Rope. 4 p. (Broderick & Bascom Rope Co., New York, N. Y.) A leaflet of information on the care of wire rope, in which all the average operator needs to know is boiled down into five or six hundred words. Describes Rope-a-Lene, a wire-rope lubricant.

Pumpings from the Old Pit

Fifteen Years Ago

OFFICES of the Delevan River Quarry & Construction Co. were moved from Jersey City, N. J., to Lambertville, N. J.

* * *

The Montezuma Gravel Co. was formed at Terre Haute, Ind., with capital of $12,000 to produce and deal in sand, gravel, shale, crushed stone, and other materials.

Ten Years Ago

FIRE of unknown origin almost destroyed the plant of the Pennsylvania Glass Sand Co. in Morgan County, W. Va. The loss was estimated at $75,000.

* * *

The C. C. C. & St. L. Railroad purchased the White Sulphur Lime & Stone Co. of White Sulphur, O., for a reported consideration of $135,000.

* * *

Active production was being maintained at the plant and quarry of the Lilly White Cement Co., near Nazareth, Pa. Large shipments were going forward by rail and truck.

* * *

Construction was being pushed by the Aetna Portland Cement Co. on its new plant at Essexville, Mich. The plant was to represent an investment of about $1,000,000.

* * *

Gravel prices were firm in the Dallas, Tex., area, being quoted at $1.50 and $2.00, f. o. b. cars at the pits.

* * *

The National Agstone Institute was considering the establishment of a limestone fellowship at Ohio State University.

Five Years Ago

THE steamer, *Carl D. Bradley,* hailed as the largest vessel ever to operate on the Great Lakes, completed its maiden voyage when it arrived at its home port, Buffington, Ind. The self-unloader was commissioned to carry limestone to the Universal cement plant at Buffington.

New corporations included the following: Webster Gravel Co., Minden, La.; Mid Island Sand & Gravel Corp., Long Beach, L. I., N. Y.; South Jersey Silica Sand Co., Bridgton, N. J.; and Portland Crushed Rock Co., Portland, Ore.

New Machinery and Supplies

New Machine Takes Dust and Fines from Gravel

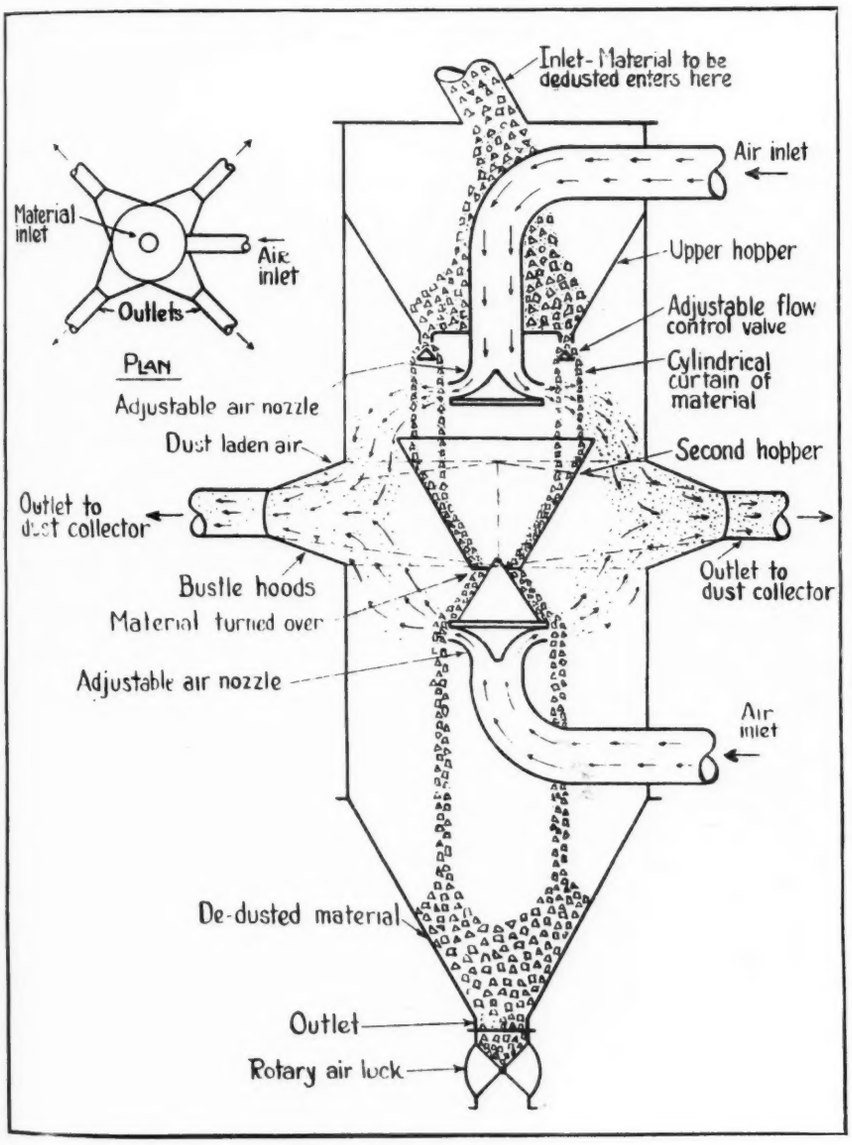
The Blaw-Knox Co. has developed an entirely new piece of equipment known as the Blaw-Knox De-Duster which is shown in the accompanying sketch. By referring to this sketch and the text, the simple and effective operation can be traced.

Sand or gravel from minus 1 in. down is run through an inlet at top into the upper hopper. It then runs through circular feed slots over the adjustable flow-control valve, where it is split up into two cylindrical curtains. As the curtains fall, an air stream issuing from the circular air nozzle throws the dust and fines out. The larger or cleaned particles fall down into the second hopper, where they are turned over and then fall on the cone, which forms them into another cylindrical curtain. This curtain passes through a second air stream for further air scouring completing the cleaning. The dust and fines are carried off through the "bustle" hood surrounding the De-Duster. The air containing the dust and fines is carried to a Blaw-Knox framed-bag dust collector where it is graded and completely collected in dry usable form.

By regulating the two air valves and the adjustable flow control, the De-Duster can be arranged to take out everything from 10 mesh down to the most impalpably fine dust.

After the sand (which is divided into two separate curtains) is "blown through" it is turned over and "blown through" again, giving a very thorough cleaning and air scouring.

The shell and hoppers are built of ¼-in. plate to resist abrasion and give long life. Piping is standard.



Explanatory drawing of the de-duster.

Four New Shovel Models Are Announced by Ohio

Supplementing the Lima 101 convertible cable-crowd model in 1, 1¼ cu. yd. sizes, The Ohio Power Shovel Co. has just announced four models which provide a complete range of sizes and types of shovels, cranes, draglines and backdiggers in gas, Diesel or electric power, and chain or cable crowd. These models are designated as the type 302, with ¾ cu. yd. shovel or 12-ton crane; type 404, with 1-cu. yd. shovel or 16-ton crane; type 502, with 1¼ cu. yd. shovel or 16-ton crane; and type 606, with 1½ cu. yd. shovel or 25-ton crane.

Bulletins on any of these models can be had by writing to The Ohio Power Shovel Co., Lima, O.

Log-Washer Simplifies Cleaning Dirty Gravel

Dirty materials being always a serious problem to sand-and-gravel producers, Smith Engineering Works, Milwaukee, has developed a log-washer for removing dirt, clay and silt from material in process.

The Telsmith log-washer is made up of two heavy "logs" or shafts, journalled at each end in a slightly inclined steel trough. This trough is made of ⅜-in. and ½-in. steel, well reinforced to give strength and rigidity. Each "log" is made of four 6-in. by 6-in. by ¾-in. angles, welded and bolted at each end to heavy flanged steel hubs, which are in turn bolted to 5-in. flanged-steel stub shafts.

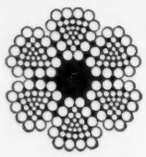
Each log is provided with a double series of heavy chilled iron "spuds," saddled and double bolted to the log and arranged spirally to convey the aggregate upward in the trough. At the lower end, each "log" is journalled in a bronze bushing, protected by a flush chamber and special self-adjusting water seals. The bevel drive gears are steel. The backgears are heavy grey iron cast gears with cut teeth.

Dirty material is chuted into the lower end of the log-washer. A good supply of water is added with the material. The heavy flights or blades then cut through the aggregate, at the same time advancing it slowly toward the upper end. A continuous stream of fresh water is sprayed on the advancing gravel. The flights or blades subject the material to a very strenuous cutting, abrading and washing action which continues the whole length of the washer.

The discharge chute on the upper end is raised from the bottom so that a bed of material is formed below the logs, preventing excessive wear on the trough. This gravel bed also serves

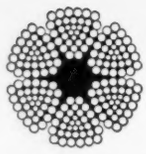
STYLE B

The "Style B" construction has been on the market since 1894. The keystone shape of the strands offers greater resistance to crushing and it also distributes external wear evenly over four wires in each strand.



STYLE G

"Style G" and "Style K," which have been recently developed, have all of the advantages of "Style B," plus the additional advantage of being more flexible.



STYLE K

for drainage and prevents excessive moisture in the product. The hydraulic water flows against the movement of the aggregate, and carries all waste material over the spillway. The overflow is provided with adjustable gate to regulate the water level in the log washer.

The Telsmith log-washer is suitable for washing either gravel or crushed quarry products. It is designed to take 3½ in. maximum rock; the oversize must be scalped out.

Recent installations of this equipment include the Makins Sand & Gravel Co., Oklahoma City, Okla.; F. C. Jordan plant at Elkhart, Ind.; and the gravel pit of the Missouri Portland Cement Co. at Memphis, Tenn.

Offers 2 New Types of Flattened-Strand Rope

A. Leschen & Sons Rope Co. of St. Louis, this year celebrating its 75th anniversary, recently put on the market two new types of patent flattened-strand construction of wire rope, which are designated as "Style G" and "Style K."

These two new designs of wire rope are somewhat similar to the well known "Style B" patent flattened-strand construction, and they have its advantages of greater strength and more resistance to wear and crushing —plus greater flexibility, which is brought about by the use of more wires in each strand as well as by an entirely new design of the center of each strand.

These two new wire rope constructions are meeting with much success on certain models of machines that are built for heavy duty, but where limited space does not permit the use of large sheaves and drums.

The patent flattened-strand construction was introduced into this country by Leschen in 1894, and the company has furnished it in four well-known types since that time. Its many specific and exclusive advantages have enabled it to give successful service under numerous conditions where standard constructions proved inefficient.

A. Leschen & Sons Rope Co., has always been active in making basic and notable developments in the wire rope industry; one of the most important of these was its Hercules grade of wire rope which was introduced in 1886. Prior to that time the plow-steel grade was considered the best that could be made. In order that this new and higher quality wire rope could be identified in appearance, they originated the idea of coloring one of its strands—red being used.

Wire-rope design, construction and manufacture have always been three vital factors in the Leschen program, and Leschen wire rope is made in a wide range of constructions. These constructions include designs of round strand, patent flattened-strand, non-rotating, preformed, steel-clad and locked-coil types. The company's slogan is "A correct construction for every condition!" as no one type of wire rope is suitable for all purposes.

6-Wheel, 30-Ton Diesel Locomotive Being Built

The Fate-Root-Heath Co. (Plymouth Locomotive Works), Plymouth, O., have recently completed and shipped a new model 30-ton, six-wheel, gear-driven Diesel-powered locomotive.

This locomotive is equipped with a six-cylinder, 6¾-in. bore by 9-in. stroke, Diesel engine developing 210 hp. at an engine speed of 1,000 r.p m. The builder also states this locomotive can be equipped with a 230-hp. Diesel engine, which makes an exceptionally powerful locomotive where speed, as well as power, is an important factor.

The six-wheel drive is particularly adapted for certain haulage conditions, as the locomotive can be used on rough and uneven tracks without danger of derailments. It is also equipped with semi-elliptic cross equalized leaf springs.

A new and improved clutch which is removable without moving the engine or transmission, is used. The size has been increased to 16 in. in diameter with eight facings. This type of clutch was designed and constructed in their own shops after many months of tests under actual working conditions.

The Plymouth Locomotive Works now has a complete range of sizes of the Diesel-powered locomotives from 6-ton up to and including 60-tons in weight.

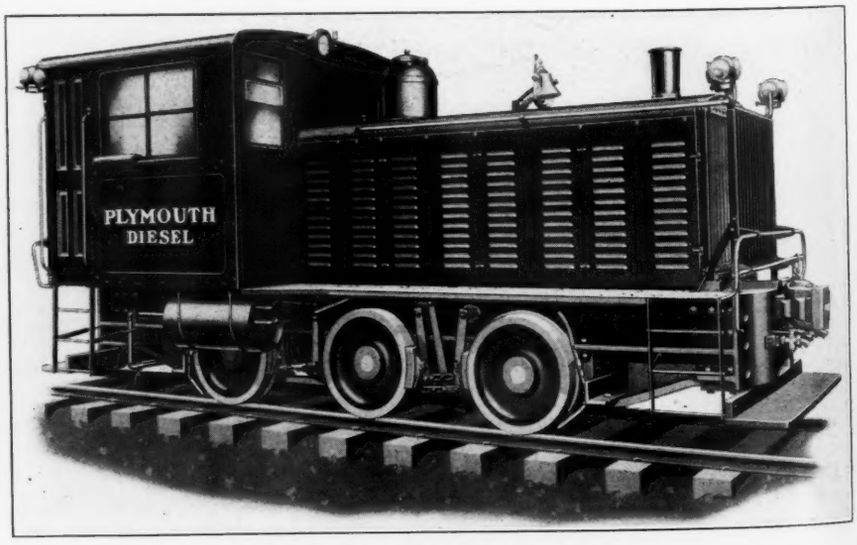
Designs Superheater to Cut Steam-Plant Costs

In answer to the widespread demand for a superheater easy and economical to install in horizontal return-tube boilers, a new and improved superheater was developed recently by The Superheater Co., New York, N. Y. Unique in design, this superheater is of compact and simple construction, so simple, in fact, that it may be installed readily by regular plant attendants. No changes are required in settings or arches of the boiler or in other plant equipment. The superheater is standard for all h. r. t. boilers.

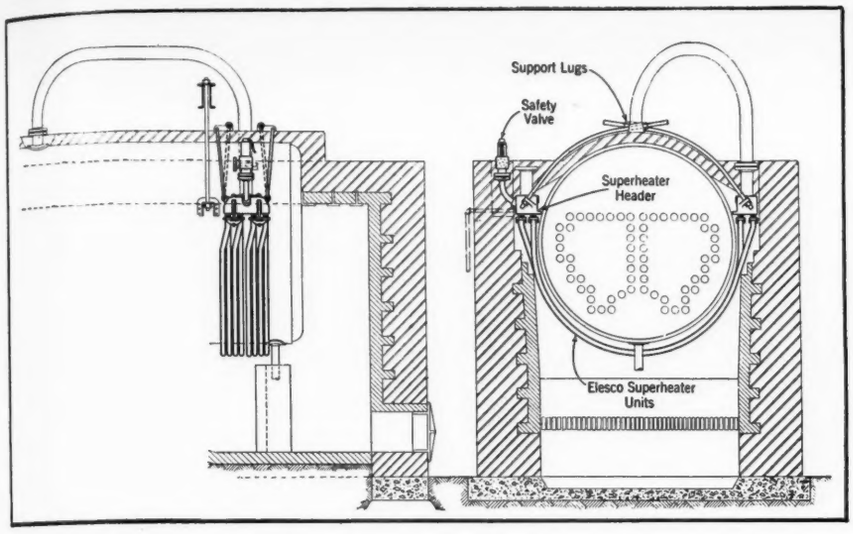
This new h. r. t. superheater comprises simply two cast-steel headers, suspended one on each side of the boiler shell, which are connected by detachable tubular elements or units extending around the underside of the boiler. The headers are supported by adjustable clamped steel rods. By raising or lowering the headers, the units are correspondingly raised or lowered in the combustion chamber, which regulates the superheat or final temperature of the steam.

This superheater is automatic in operation. Saturated steam is carried from the boiler nozzle through a connecting pipe to one header, known as the saturated-steam header. From there it passes to the other header or superheated-steam header, through the units under the boiler, during which it is subjected to the relatively intense heat of the gases of combustion in the combustion chamber. The steam, then superheated, passes to the main steam line for use in the plant.

By superheating steam in this posi-



The 6-cylinder, 30-ton Diesel locomotive.



Superheater installed in an h.r.t. boiler.

tive, simple manner, many economies, which hitherto were reserved to larger plants, are made possible to the steam plant with h.r.t. boilers. Use of superheated steam in steam power generation reduces steam consumption of prime movers, condensation losses, and fuel and water consumption by overall plant economy, which increases the efficiency both of the boiler and entire plant, as well as increasing the life of the equipment. Superheated steam is widely used advantageously also for many processes in industrial plants.

Develops Vibrator Unit for Loaders, Conveyors

A small and compact single-deck vibrator, 36 in. wide and 58 in. long, of all-steel construction and weighing approximately 450 lb., for use at ends of portable conveyors and loaders, or in place of plain gravity screens at points of discharge from bins, has been placed on the market by the Universal Vibrating Screen Co. of Racine, Wis. It weighs but little more than the average plain gravity screen, such as have been used in those positions heretofore, it is easily installed and the cost is low. The accompanying cut shows one of these units installed on a portable conveyor.

Vibrating screen on portable conveyor.

Improvements in design and construction have also been adopted on the Type "M" heavy-duty double-deck screens manufactured by this company, and they report increased sales on this model, especially to sand-and-gravel producers.

Pre-Forming Makes Wire Rope Last Much Longer

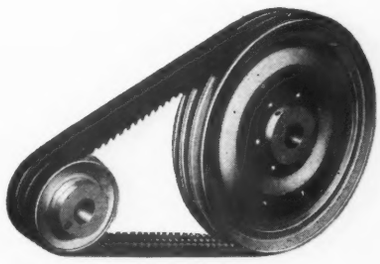
The Broderick & Bascom Rope Co. have recently placed on the market our Flex-Set pre-formed wire rope. Pre-forming refers to the process of manufacture and rope of this construction can be furnished in any of our regular grades of steel.

Pre-forming largely eliminates internal stress which has always been a source of trouble in wire rope. The result is easy handling and easy splicing. In operation the rope goes around the sheaves and drums without turning in the grooves, and with little movement among the wires and strands. This reduces external and internal wear to the very minimum—makes the rope last much longer.

Rubber Firm Announces New Line of V-Pulleys

The Dayton Rubber Manufacturing Co. of Dayton, O., makers of cog-belt drives, announce a new economy in power-transmission equipment — namely, its new line of "Day-Steel" single and multiple V-groove pulleys for use with Dayton Cog-Belts, for ratings of 7½ h.p. and below.

These new "Day-Steel" pulleys not only effect a tremendous saving in cost, but are also much lighter in weight, making them ideally suitable for machines requiring these smaller horsepowers. They are accurately formed from heavy gauge pressed steel for maximum strength — strongly welded both at the rim and at the web—and rigidly assembled with a hub of unique construction to give an accurately balanced and true running pulley of exceptional ruggedness and pleasing proportions. A high-quality aluminum



New V-groove pulley.

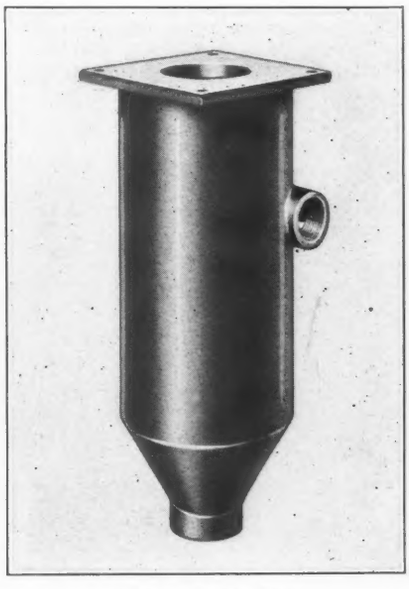
finish adds much to the appearance of the product. Complete engineering and price data is given in Bulletin No. 110 which will be furnished on request to the company's offices at Dayton.

Classifier Developed to Size Minus-¼-In. Sand

The Deister Concentrator Co. of Ft. Wayne, Ind., manufacturer of the Leahy heavy-duty vibrating screen report active interest in the Concenco Vortex Classifier for applications of sizing concrete sand, blast sand, asphalt sand, filter sand, locomotive sand, etc.

The Concenco Vortex Classifier is used in classifying minus ¼ in. sands. In design it is simple and rugged. It contains no "baffles" to sponsor chokeups. Larger tonnage capacity, higher per cent. solids in the discharge and the small amount of hydraulic water required are other features.

The classifier may be installed as a single unit or in series to obtain as many products as desired.



The vortex classifier.

New Cutting Appliance for Welding-Torch Use

To accord with the economic requirements of manufacturing under present conditions the Smith Welding Equipment Corp., Minneapolis, Minn., has placed upon the market a new cutting assembly, or attachment, for a welding torch called the "Money Saver" cutting assembly. To maintain the efficiency of the cutting assembly and yet to manufacture it at a considerably less cost was the problem involved.

Torch with cutting assembly.

In designing this cutting assembly the Engineering Department eliminated every customary feature, usually considered necessary in the manufacture of such apparatus, such as levers for the cutting oxygen, adjustable unions to change the position of the assembly in the handle, etc., and substituted for these features valves of the greatest simplicity.

The cutting oxygen valve is a triple thread, screw valve with knurled thumb wheel as shown, so arranged that it can be quickly opened and closed with the thumb. The valve forging has been reduced to the simplest possible design, the cutting tip automatically evens up the flames. Double seats and all other parts, not absolutely essential to operation have been eliminated, resulting in simplicity of construction and manufacturing costs far less than the conventional type of cutting assembly. The new assembly has been approved by the Underwriters' Laboratories.

The result is a tool which can be sold at a lower price and yet cuts as efficiently as any other type of similar equipment. Simplicity in design is a factor in engineering which may be the solution of many such problems.

Versatile Hauling Unit Driven by Two Engines

Power shovels, cranes and draglines had been successfully mounted on crawlers for several years so that the great weight of the machine could be moved over relatively soft ground in grading, excavation and drainage work. It was reasoned that the same traction principle adapted to a material-hauling unit should prove equally as valuable in supporting big loads on soft ground. Field experience had pointed the way. The result was a Dumptor built by the Koehring Division of the National Equipment Corp., of Milwaukee, on full-length multiplanes—a self-contained hauling unit which would meet field conditions.

Along with this development came other outstanding features of design which were based on field experience. The front-end dump permits the operator to drive the Dumptor to the end of a fill, dump his load, back up and turn around empty, thereby eliminating the necessity of turning on the fill with the load. In dumping position the body forms a powerful bulldozing blade. Two 4-cylinder engines, one driving each multiplane, provide plenty of power, easy steering for handling in close quarters and all-way dumping ability.

These practical advantages of Dumptors have lowered dirt-moving costs under varying conditions all over the country; actual operating figures during the past two years have proved the economy and efficiency of the machine.

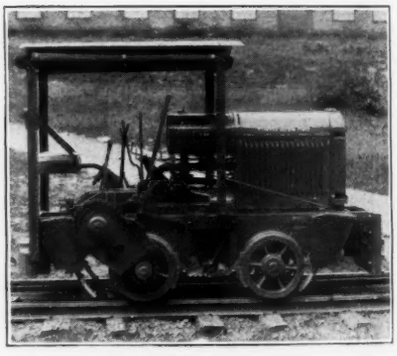
The Dumptor may be driven to the excavator, loaded and backed out, or it may be pivoted in its own tracks before or after loading and driven out, depending upon the conditions of the job. This flexibility in moving with or without a load around the excavator shows a big profit margin in time saving. On some jobs the excavator is frequently kept idle while ordinary hauling equipment is being turned or backed into place.

The machine is also supplied with pneumatic tires or lag-type tractor wheels where conditions warrant the use of this type of equipment.

Presents New Series of Industrial Locomotives

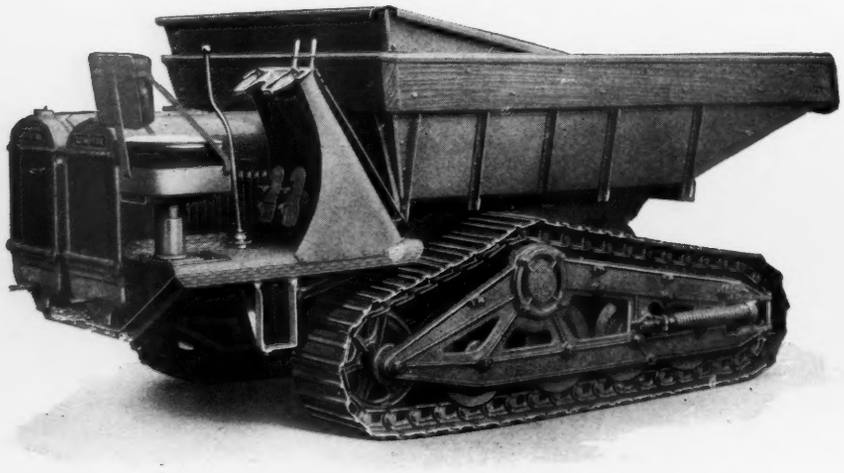
The Brookville Locomotive Co., of Brookville, Pa., has recently developed a new line of industrial locomotives known as Series B-I-30. These models come in 4, 5, 6, 7, and 8 tons weight and can be supplied for standard and narrow-gauges. The power unit is the new Model I-30 McCormick-Deering, produced by the International Harvester Co. This tractor, while similar in appearance to the Model 20 McCormick-Deering, which has always had an enviable reputation in the industrial world, is designed to transmit a 20-per cent. increase in engine power.

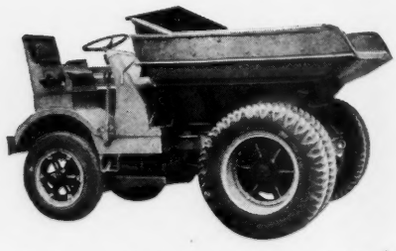
Three speeds, with a range of 2 to 15 miles per hr., are provided in both forward and reverse. Brookville quality is retained throughout and every essential part provided. Prices are lower than ever before for similar quality, capacity and weight.



One of the new locomotives.

A new bulletin B-29, which describes these locomotives in detail, may be had by writing direct to the company at Brookville, Pa.





Two views of the Dumptor, one showing the crawler mountings, the other a model mounted on pneumatic tires.

Saving Through Safety

Some Suggestions on Guarding Machinery

By R. R. HOWARD
National Safety Council

PRACTICALLY every industrial plant in the cement and quarry field has machinery which should be guarded. This machinery may be distributed over the area of the plant in scattered units, or it may be assembled in one or more groups. The fact that such machinery is probably scattered, and probably used by only comparatively few employees, may tend toward its neglect from the viewpoint of plant safety. Or it may happen that the chief value of much of this machinery will be its emergency or irregular use. If so, it is probable that a number of different persons will be using this machinery for short periods of time, and it is probable that some of these persons will not be well trained in a knowledge of the hazards of these machines or the best work methods to overcome these hazards.

A good many different machines might be listed as possible hazards in an average cement and quarry plant. Among the most dangerous machines —if such machines are used at all— are woodworking machines and metal working machines. Other hazardous machines or appliances are grinding wheels, conveyors, hoisting devices. If there should be a forge shop, some of the probable hazards are hydraulic presses, power hammers, alligator shears. If there should be a sheet-metal shop, possible hazardous equipment would be bending rolls, angle-bending machinery, plate shears, riveting machines, etc. It is probable, of course, that only a few of the machines or appliances listed above will be found in an average plant shop for the cement and quarry industry.

It would be possible also to list a good many special hazards which are common to a number of different machines. These would include hazards from gears, belts, pulleys, shafting, collars, couplings, and power transmission apparatus in general. Other mechanical hazards relate to electric switches, motors, engines, ladders, stairs, platforms, and steps. There are many other mechanical hazards in the industry, relating to railway operations, drilling equipment and the like.

In a thorough program for guarding the machinery of your plant certain principles should be kept in mind. These principles when applied should take care of a larger percentage of all hazards. And these principles of course, should be supplemented by a list of practical rules based on the exact equipment and the previous accident experience of the plant.

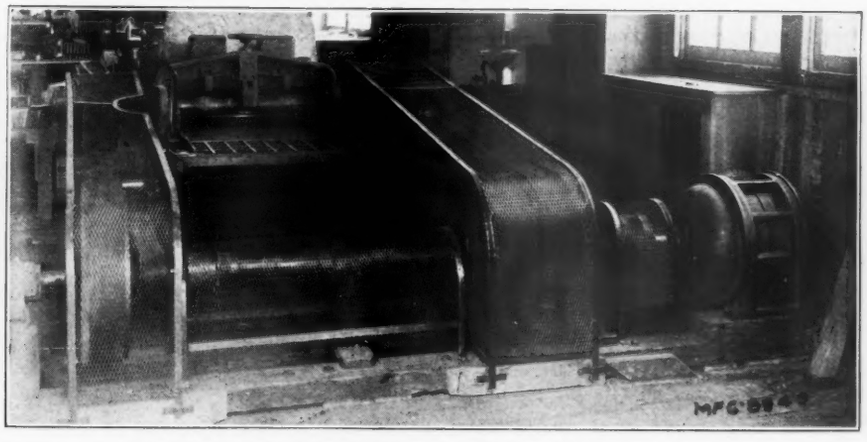
There was a time in the history of the "safety movement" when it was believed that practically all industrial injuries could be prevented through the mechanical safeguarding of machinery and equipment. But experience has demonstrated that three-fourths to nine-tenths of all injuries usually are due to the "human element"—that mechanical guards must be supplemented by safety habits and training in correct and efficient ways to work. But mechanical guards, if well adapted to the hazards for which they are intended, will accomplish certain results.

First, such guards will prevent hands and feet and other parts of the body from coming in direct contact with the machinery. Well planned guards are practically fool-proof. Such guards, if actually kept in place and kept in condition, will prevent certain kinds of injuries.

Second, such guards have an important psychological influence. They will greatly aid the superintendent and the foreman in his necessary program for the continuous education of his workers. These guards will act as warning signals, they will be a continuous reminder that a hazard does exist and that there is a reason for the guard at this place. This result of course assumes that there is a continuous program of safety education for new and old workers, teaching them to recognize the hazards of their employment and the best methods of work for their particular jobs.

Third, such guards will prove continuously that the company management is sincere in its efforts to prevent accidents. It will prove to the individual worker that the manager is doing his part. It will afford the foreman an excellent opportunity to impress on the individual worker that he also must coöperate by carrying out his own part of the plant safety program. Thus the worker can prove his own safety sportsmanship toward the management and toward his fellow workers, and toward the foreman himself in his attempt to make a safety record for his department.

Fourth, when the worker is properly instructed as to the meaning of guards and if he is so encouraged by the management and by his foreman, the very presences of these guards will encourage the worker to develop practical safety suggestions. A guard which is well planned and well placed will not hinder production. But it often happens that a safety guard does hinder production. This is one of the reasons of course, why workers take off or attempt so often to take off safety guards. Where it is recognized by the workers or by the management that safety guards do hinder production the workers should be encouraged to make suggestions for new guards which would lessen or eliminate this interference with efficiency. A worker who has had a part in planning a new guard which is an improvement thus takes a pride in making proper use of this guard to bring both safety and efficiency results. From this viewpoint it is a good practice for the foreman, before making, ordering or recommending guards of any kind, first to consult with his men about the hazards which the guards are meant to control and about the best possible guards for this purpose. Thus by the time the guards



Shafting, belts and couplings well equipped with approved guards.

are in place, the worker has already had the best possible preliminary instruction in the necessity of the guards and their most efficient care and use.

Fifth, it should be kept in mind that one of the primary purposes of guards is to prevent damage to machines and other equipment and damage to materials. It has been a common mistake in the past in many plants when accident statistics are assembled, to neglect statistics which concern the direct and the indirect costs of these accidents. Safety leaders are coming to take a much wider view of accidents, and to include as an "accident" any happening which interrupts a work schedule and causes damage to machinery or materials, even though there may be no direct injury to a worker.

A guard to be wholly adapted to its purpose must meet a number of special conditions. There are a number of general principles which are common to most guards.

An efficient guard should be so designed and constructed that it will prevent all accidents on the part which is guarded. It should not only prevent injuries to the operator while at his regular work, but it also should prevent injuries to the operator or to a passer-by in case they should slip or fall or come in contact with the machine in an unexpected manner.

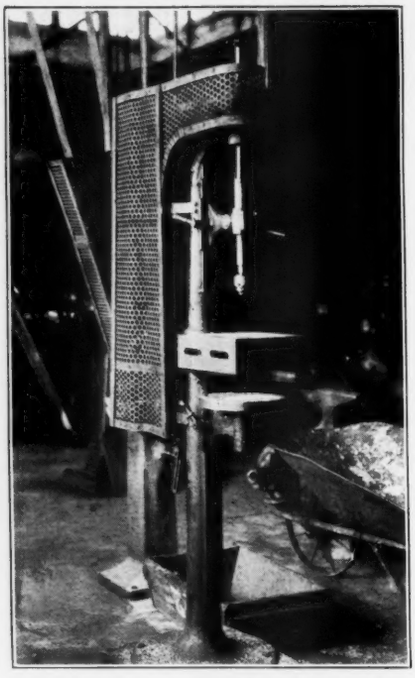
As previously stated, a guard should not interfere with production.

It has been found better, as a ru'e, that a guard should be attached to the machine and not to the floor.

The guard should be so installed that the equipment which is guarded will still be easily accessible for oiling, inspection and repairs. This means that the guard often should be hinged as a door, or developed as a removable section which may be attached in some way to the remaider of the guard or the machine. If this method is not followed there usually is danger that the guard may be taken off or left off permanently.

The guard should not interfere with cleaning or sweeping around the machine. The guard should be strong enough to resist injury and keep its shape. This emphasizes the very important point of the selection of the proper material for the guard, and this item will be discussed later in more detail. In general, a light and flimsy guard soon becomes bent or broken and is discarded. In the end a substantial guard usually is cheaper.

In general, metal guards are usually better than wooden guards. A wooden guard may easily become soaked with oil and thus add a fire hazard to the other hazard. A metal guard usually seems to be more definitely a part of the machine. It has been said that a "metal guard looks as if you *wanted* to accept its warning; and a "wooden guard looks as if you *had* to." There are some conditions of course where a wooden guard would be more satisfactory for resisting certain acids or fumes.



A drill press inclosed with perforated metal.

It is always a good plan, when possible, to interlock the guard with the operating mechanism in such manner that the machine can not be operated unless the guard is in place. Thus the guard will become more definitely "fool-proof" and the worker will be trained in a recognition of the hazard.

A guard often can be so planned that in addition to controlling a hazard it also may help to prevent wear on the part which is guarded. For example, when a gear is enclosed with a solid guard which may be packed with grease or oil.

There is still another important principle in planning and placing mechanical safeguards. Too often it is true that guards are not placed until after an accident has occurred. Thus a guard in reality is a monument to an injury and possibly even a death. The modern development of safety and efficiency demands that when we consider the placement of guards we should not ask the question "Has an accident occurred here?" Rather, we should ask "Can an accident occur here?"

The special investigators of the National Safety Council who prepared the Safe Practices Pamphlet on "Construction of Machinery Guards" have summarized as follows the requirements of a good machinery guard:

1. The guard must afford maximum protection.

2. It must not interfere with the operation of the machine.

3. It must be simple in design and construction, and the enclosed part should be easily accessible for lubrication, repairs or other routine changes.

4. It must be durable; strong enough to withstand not only natural wear and tear, but also abuse.

The selection of material suitable for guard construction is a very important subject, especially in a plant where a number of such guards must be constructed and maintained, or where the machinery is isolated in such manner that it requires unusual protection.

The materials usually employed in guard construction are wood, sheet metal, cast metals, expanded metal, woven wire and perforated metal. Other such materials as fibreboard of rigid construction are used, but these materials deteriorate rapidly under certain conditions.

Wood may be the most useful material under conditions where there may be rapid deterioration as a result of chemicals or fumes. Also wood is best under certain conditions near electrical apparatus where there is possibility that ground connections of metal guards may fail. But it should be remembered that wood has several disadvantages. It usually is an additional fire hazard. Where a belt is guarded and if there is not sufficient clearance the belt may produce sawdust which if soaked with oil becomes a decided fire hazard.

Sheet metal is comparatively stronger than any other material that is used in guard construction. Regardless of certain disadvantages no other materials will be as satisfactory in as many instances. Sheet metal offers opportunity for enclosing gears, sprockets and chains in such manner as to aid in their lubrication.

Portable Operation Employs Washer

ALTHOUGH washing equipment is usually not associated with the operation of portable plants, the Luce County Road Commission up in Michigan is using single-flight washers successfully on two portable layouts, one of which is pictured above. The conveyor carrying the pit-run material to the screen and the washer, which is mounted on a trailer along with a power unit, may be seen. The washing equipment was supplied by the Eagle Iron Works.

Eighteen tons per hour from a No. 19 Crusher–100% through three-eighth inch opening using less than fifteen horsepower

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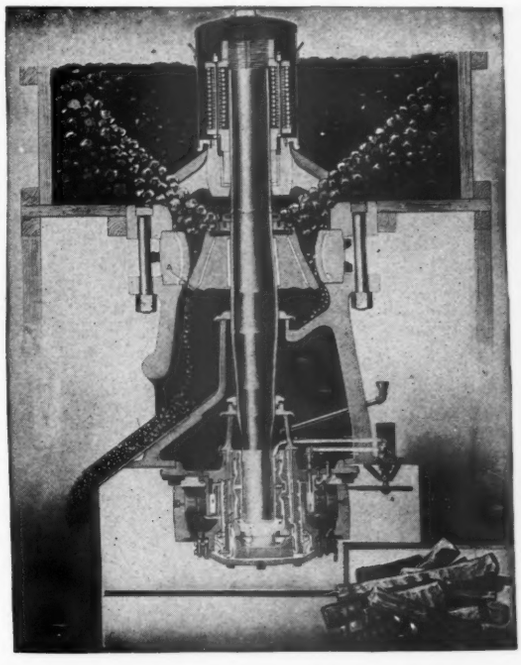
Plus 3 mesh	21½%
Minus 3—Plus 4	17 %
Minus 4—Plus 14	36½%
Minus 14—Plus 48	15 %
Minus 48—Plus 100	4 %
Minus 100	5½%

This was crushed at the rate of 18 tons per hour.



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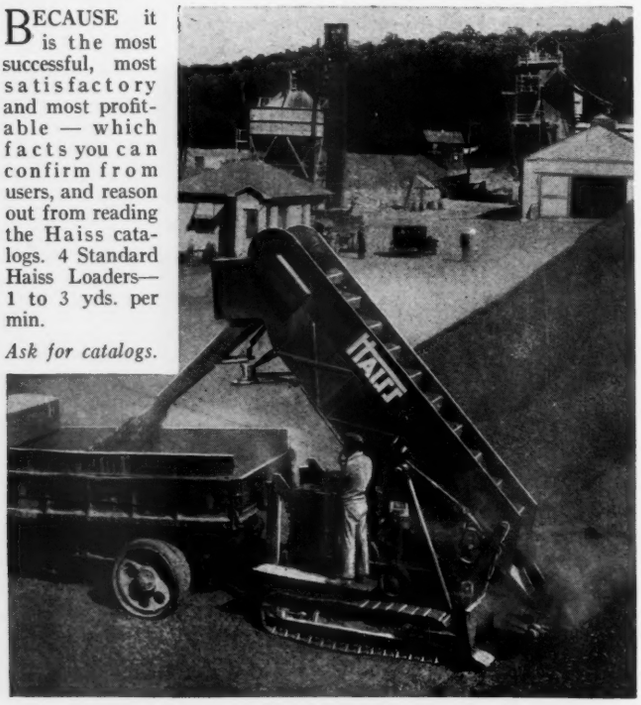

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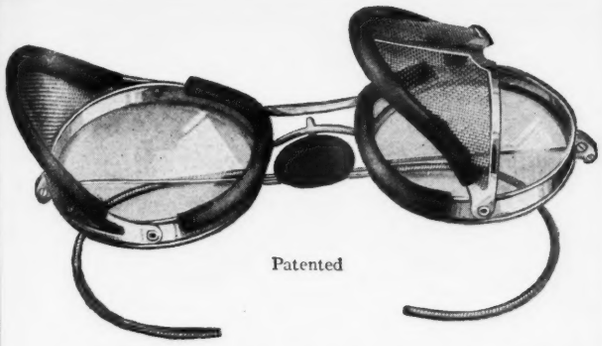

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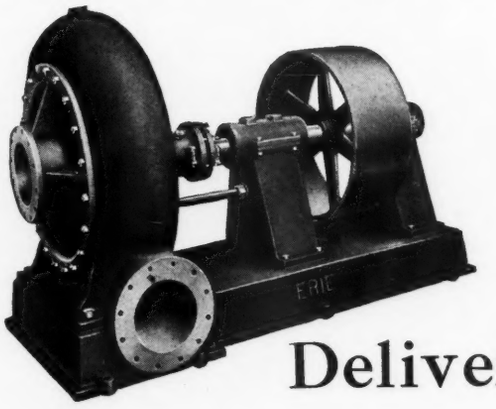

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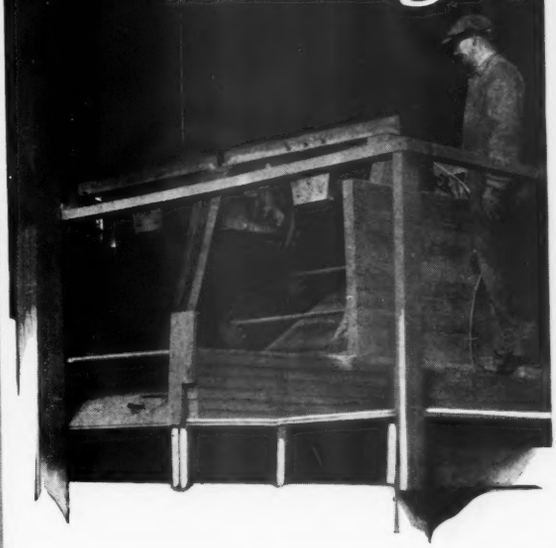
Here's your bigger tonnage!



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Simply fill in and mail the coupon, or clip it to your letterhead.

Gifford-Wood Co., Hudson, N. Y.
Send me full information on the Mitchell Electric Vibrating Screen.

Material to be screened .....

Tonnage screened per hour .....

Company .....

Address .....

Position .....

P&Q

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1842

Lewistown Foundry Products
ARE
Performance-Tested

BUCKET ELEVATORS
REVOLVING SCREENS
CRUSHERS DRY PANS

Lewistown Foundry & Machine Co.
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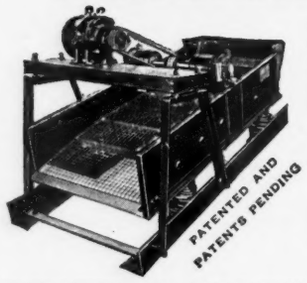
PLAT-O
VIBRATING SCREEN



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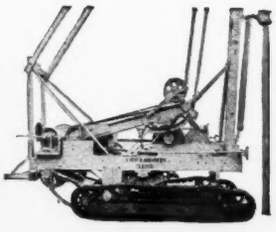

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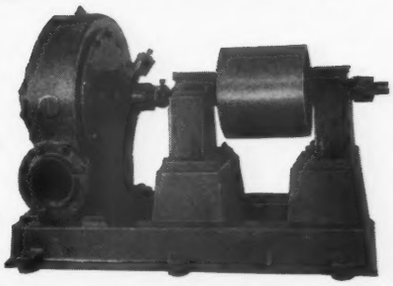

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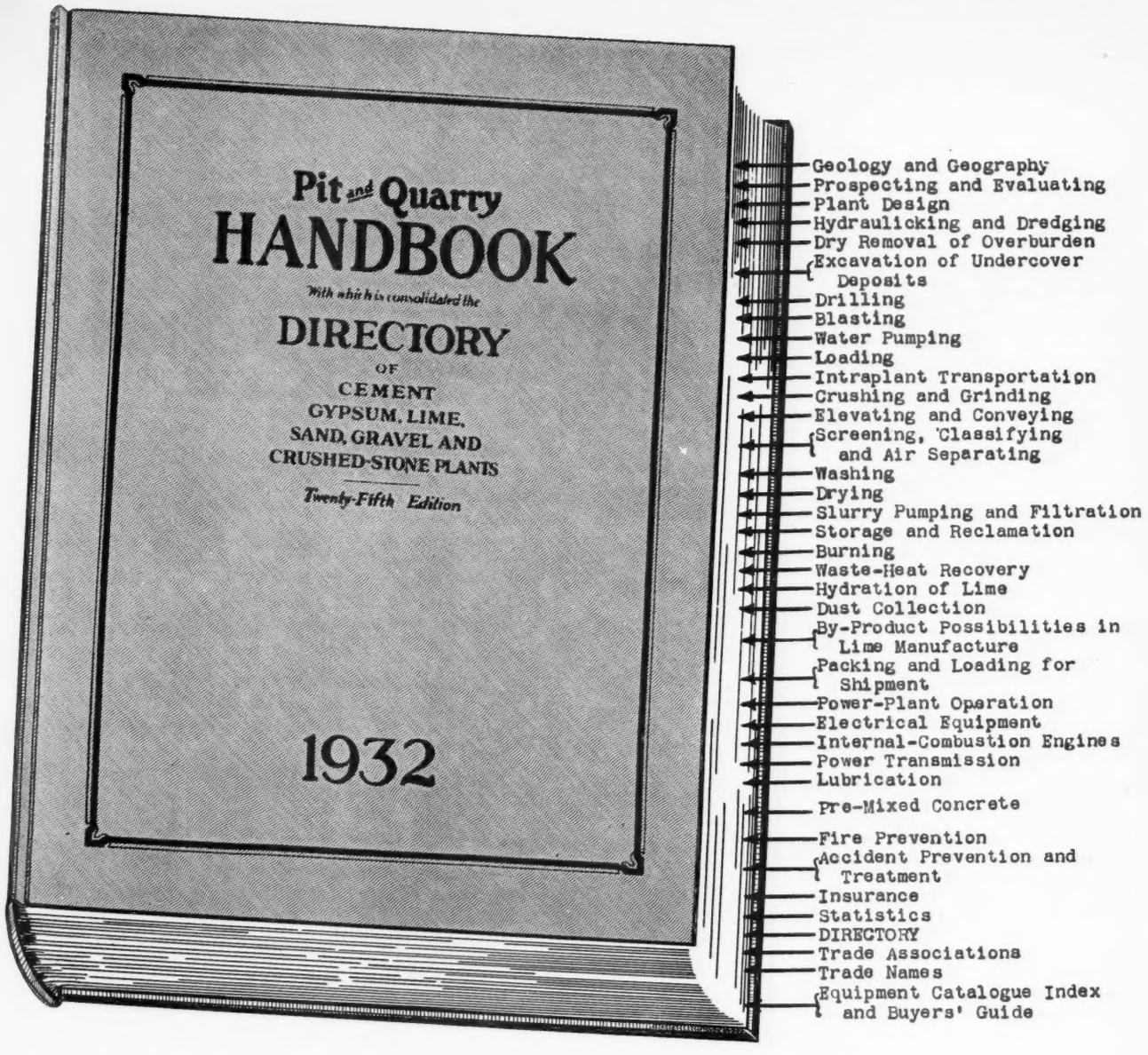

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